



ION-R100S User Manual

Single Monitor HD Secure Display Station

Document Version 4.4



ION-R100S

User Guide

©2016-2024, IONODES INC

All Rights reserved.

No part of this documentation may be reproduced in any means, electronic or mechanical, for any purpose, except as expressed in the Software License Agreement. IONODES shall not be liable for technical or editorial errors or omissions contained herein. The information in this document is subject to change without notice.

The information in this publication is provided “as is” without warranty of any kind. The entire risk arising out of the use of this information remains with the recipient. In no event shall IONODES be liable for any direct, consequential, incidental, special, punitive, or other damages whatsoever (including without limitation, damages for loss of business profits, business interruption or loss of business information), even if IONODES has been advised of the possibility of such damages and whether in an action or contract or tort, including negligence.

This software and documentation are copyrighted. All other rights, including ownership of the software, are reserved to IONODES Inc. Windows and Windows Embedded Standard are registered trademarks of Microsoft Corporation. All other brand and product names are trademarks or registered trademarks of the respective owners.

The following words and symbols mark special messages throughout this guide:

Warning: Text set off in this manner indicates that failure to follow directions could result in damage to persons or equipment.

Note: Text set off in this manner indicates special instructions which should be paid attention to.

Table of Contents

1	Important Safety Instructions	5
2	Cleaning instructions.....	6
3	Handling Notes	6
4	Moisture and Condensation Notes	6
5	Before you begin.....	7
5.1	About the ION-R100S	7
5.2	Parts List	7
6	Hardware Installation	9
6.1	Equipment Installation.....	9
7	Connections	11
8	Powering the ION-R100S for the first time	12
9	Device Configuration.....	15
9.1	Network Configuration Basics.....	15
9.2	Setting Up Initial Network Configuration Locally	16
9.3	Setting Up Initial Network Configuration Remotely	22
9.4	Setting up Time	26
9.4.1	Setting up NTP time server	26
9.5	Setting up Security Policy	27
9.6	Configuring System Features	27
9.7	Video Configuration Concepts	30
9.8	Configuring Video Connections	31
9.8.1	Video over RTSP Data Sources.....	31
9.8.2	Testing a connection	36
9.8.3	Video over HTTP Data Sources	38
9.8.4	Video over Passive RTP Data Sources.....	38
9.8.5	Decoding Priority	39

9.8.6	Displaying a Data Source	40
9.8.7	On-Screen Displays.....	42
9.8.8	Displaying an On-Screen Display.....	44
9.9	Configuring Web Connections	46
9.10	Image Carousel	48
9.11	Video file playback	53
9.12	Configuring Views	56
9.13	View Sequences.....	58
9.14	Configuring Video Output.....	60
9.15	PTZ Control	63
9.16	PTZ Keyboard	64
10	Media Library	66
11	Live PTZ.....	67
12	Security	68
12.1	User Account Management.....	68
12.2	Certificate Management	70
13	Performing a Firmware Update.....	74
13.1	Batch Firmware Update	75
14	Diagnostics.....	78
14.1	View Stream Details.....	78
14.2	Safe Mode	79
Annex A – Statement Limited Warranty		83

1 Important Safety Instructions

WARNING: Read and save these instructions! Follow all warnings and instructions specified within this document and/or on the equipment.

CAUTION: The unit will be powered on upon connecting a valid power supply source. Please make sure to properly shutdown the device's operating system prior to removing its power source.

The equipment shall be installed in a FIXED or DESKTOP configuration and should be installed by qualified personnel only (person having the appropriate technical training and experience necessary for product installation).

When installing the equipment, please make sure that cables are installed so that accidents cannot occur. Cables connected to the equipment must not be subject to any mechanical strain.

To reduce the risk of fire, electric shock and/or injury, observe the following:

- Do not position the equipment as such that persons could walk on the connected cables.
- Do not spill any type of liquid substance on or near the equipment.
- Do not touch the equipment and its connected cables during an electrical storm; there may be a risk of electric shock.
- Do not attempt to connect this equipment to electrical outlets controlled by switches or automatic timers.
- Do not attempt to perform hardware service on this product yourself. Opening the equipment casing may expose you to dangerous voltage or other risks. Refer servicing to IONODES technical service personnel. Never open the device yourself as this will void the warranty.
- The equipment should be situated away from heat sources such as radiators, heat registers, stoves, or other products that produce heat.
- Do not place a heavy object on or step on the product. The object may fall, causing serious personal injury and serious damage to the product.

Note: Opening the equipment case, damaging, or altering the tamper proof label will void the warranty.

2 Cleaning instructions

- Unplug this product from the wall outlet before cleaning.
- Use a soft dry cloth for cleaning.
- For stubborn dirt, soak the cloth in a weak detergent solution, wring well and wipe. Use a dry cloth to wipe it dry. Do not use any type of solvent, such as thinner and benzene, as they may damage the surface of the product.

3 Handling Notes

When shipping the product, the original shipping carton and packing materials should be used. For maximum protection, repack the unit as it was originally packed at our factory.

Do not use volatile liquids, such as insect spray, near the unit. Do not leave rubber or plastic products in contact with the product for long periods of time. They will leave marks on the surface finish.

4 Moisture and Condensation Notes

Moisture condensation will damage the product. Read the following notes carefully.

Moisture condensation occurs during the following cases:

- Transferring the product directly from a cold place to a warm place.
- Using the product in a room where you just turned on the heater, or a place where the cold wind from an air conditioning unit directly hits the unit.
- In the summer, when moving the product to a hot and humid place after leaving an air-conditioned space.
- Using the product in a humid place.

Warning: Do not use the product when moisture or condensation may occur. If the product is used in such an environment, it may damage discs and internal parts.

5 Before you begin

5.1 About the ION-R100S

The ION-R100S decoder delivers high quality video decoding and display to the video surveillance market. It is an embedded, high-performance digital video decoder, capable of decoding multiple H.265, H.264 and/or MJPEG video streams and display them onto a Full HD monitor.

The high-performance decoding capabilities of the ION-R100S offer a cost-effective way to decode and display digital camera streams while providing the benefits of video over IP.

The ION-R100S provides innovative configuration options and tools that can significantly decrease the amount of time and effort required to deploy a unit. Using web-based configuration tools, users can easily and remotely manage all aspects of the appliance.

To support high-performance decoding, while keeping the total cost of ownership within budget constraints, the ION-R100S uses highly efficient hardware-based stream decompression.

The ION-R100S is fully compatible with H.265, H.264 and MJPEG video streams provided by most third-party IP cameras and video encoders on the market. Combined with the IONODES line of IP-based video encoders, the ION-R100S can also decode video streams provided by most third-party analog cameras.

5.2 Parts List

Qty	Description
1	ION-R100S appliance
1	5V DC power supply with country-specific power plug attachments
1	VESA mounting bracket and screws
1	Quick install guide

Below are additional items which are not included but may be required:

- USB mouse & keyboard
- Display with HDMI interface
- Internet access and/or a network switch
- Power bar with surge protection

Note: When unpacking, inspect the shipment box and appliance to identify any possible damages due to shipping. Make sure all items have been delivered and that no items are missing. Contact your IONODES representative should you find any damages or defects.

Note: The product serial number label helps the IONODES product support team identify your device and its factory configuration if your ION-R100S or its components require service. The label is attached on the underside of the enclosure.

6 Hardware Installation

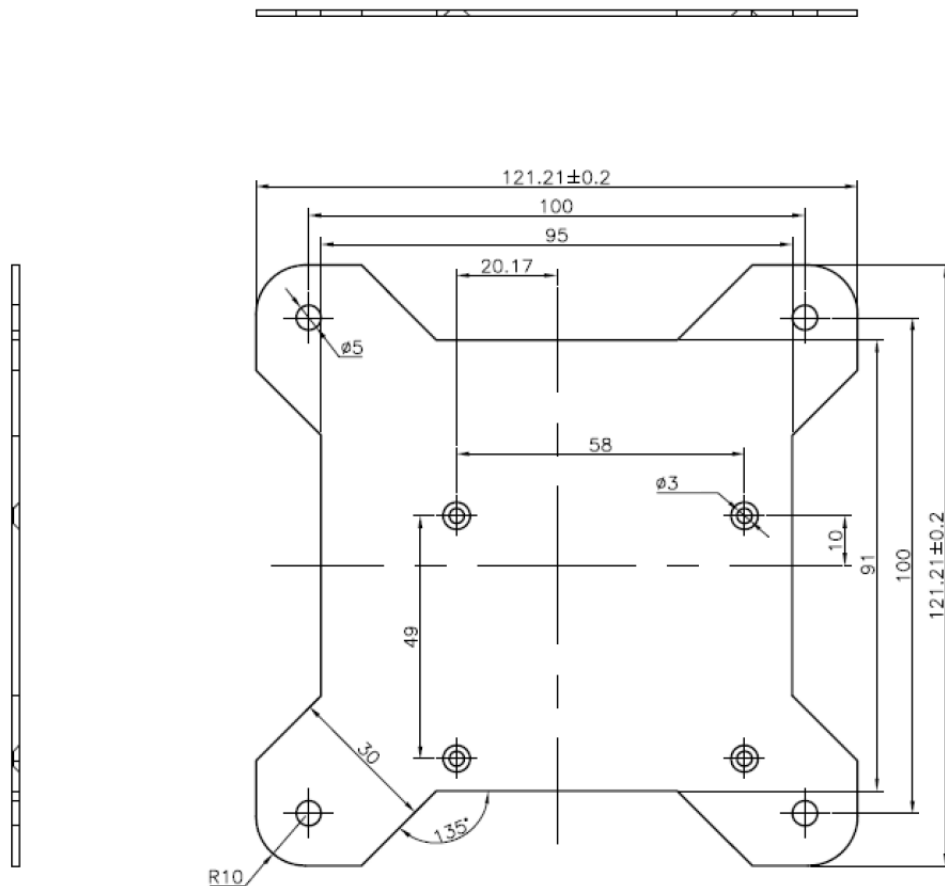
6.1 Equipment Installation

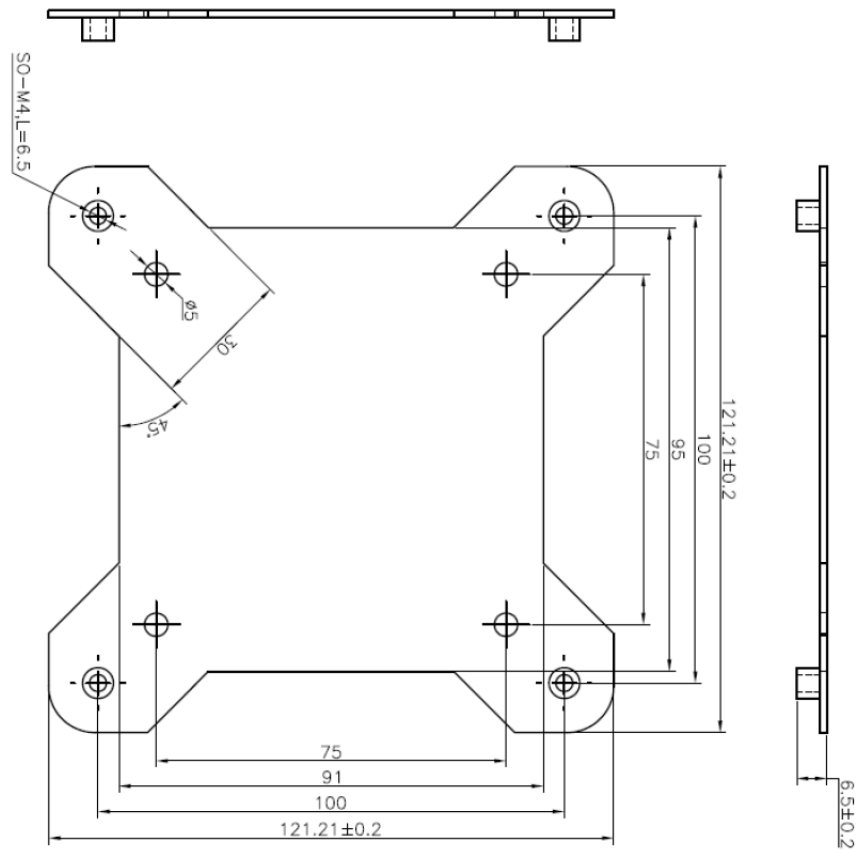
The ION-R100S can be placed on a flat surface, such as a desktop, or mounted via the available mounting bracket. When installing the ION-R100S, position the unit to allow for cable clearance at the front and rear of the unit. Make sure that minimal air flow is provided to the unit.

The ION-R100S can be mounted to various mounting structures via the available VESA mounting assembly. Ideal to mount the ION-R100S behind a screen. Note that VESA mounting screws are shipped with the device.

A schematic of the VESA plate mount is provided below*:

**All dimensions are in mm*

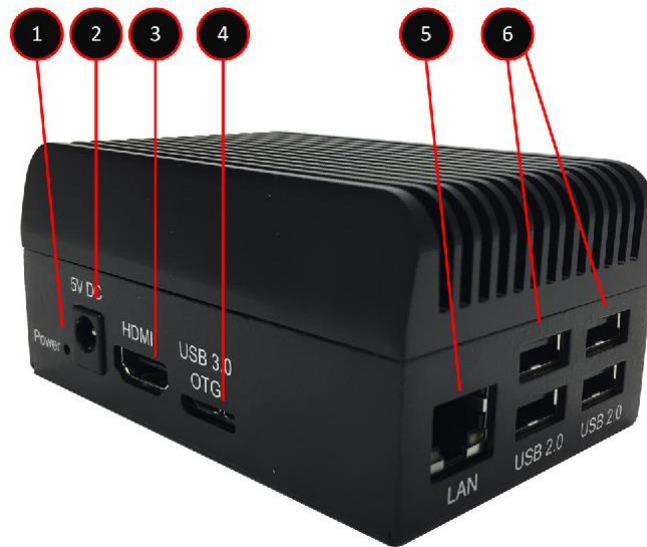




Warning: Be careful not to damage the enclosure when using mounting screws.

7 Connections

The ION-R100S offers one dedicated digital video output connection (HDMI), one LAN port as well as several USB ports. More details can be found below.



1. **Power button (recessed)**

The power button can be used to turn the unit on or off. It needs to be pressed with a small sharp object like a paperclip.

2. **Power Input**

Appliance power connector. Connect to the power adapter provided with the appliance (5V DC, 4A, 20W max).

3. **HDMI Output**

HDMI v1.4b connector interface for video output to a single screen with max. 1080p resolution.

4. **USB 3.0 Port**

General purpose USB connector interface. To be used for future expansion.

5. Ethernet Port

Gigabit Ethernet (10/100/1000 Base-T) RJ-45 network port. Please use RJ45 (cat. 5e or 6) network cable. Note that the ION-R100S cannot be powered using Power-over-Ethernet (PoE).

6. 4x USB 2.0 Ports

General purpose USB connector interface. To be used with mouse & keyboard.

8 Powering the ION-R100S for the first time

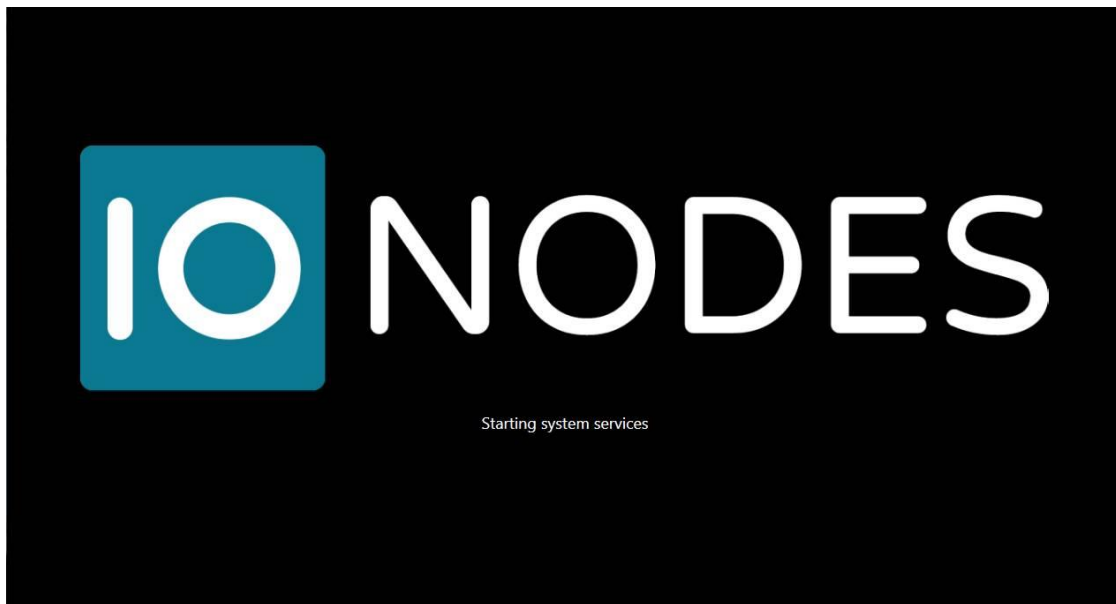
Before you can use the ION-R100S, you need to connect the following cables:

- Display: You can connect one display using the HDMI connector
- Ethernet network
- Keyboard and mouse (optional)
- Power

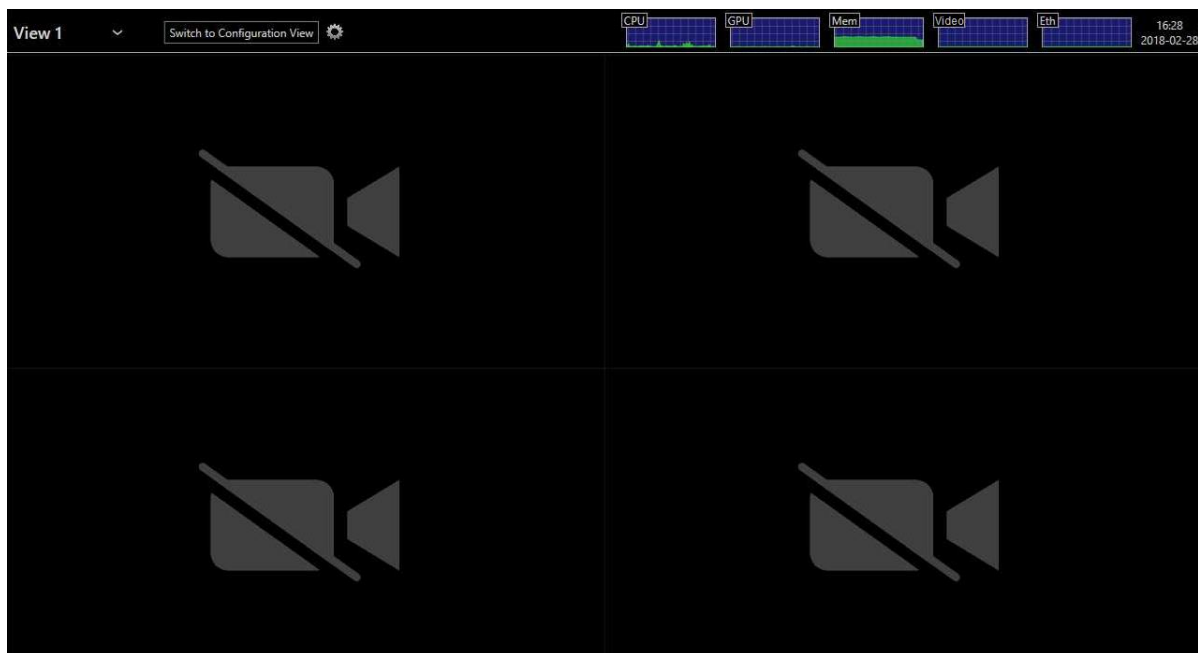
Connecting a keyboard and mouse to the ION-R100S allows you to configure the ION-R100S locally and for this reason are strongly recommended. If you plan on configuring the device remotely, then the keyboard and mouse are optional.

Note: The only layout supported for a directly attached USB keyboard is US QWERTY. This is due to the closed nature of the embedded OS, which prevents any changes to its default configuration.

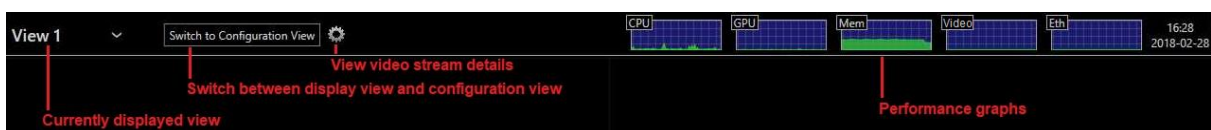
On first power on, once all the required cabling is connected, the appliance will boot automatically. If the appliance was previously shut down using the power button, to turn it back on, you'll need to press the power button for a couple of seconds and then release. After a few moments, the image below appears on the connected display:



When the device is ready to be used, the display switches to the main user interface:



The ION-R100S is now ready to be configured.



- **Currently Displayed View**

In the top left corner appears the view currently displayed. You can select a different view by clicking the down arrow beside the view name. Views are configured using the device's web interface or by switching to configuration view (see below).

- **Switch to Display/Configuration View**

This button allows you to switch between displaying video and the configuration interface.

- **Video Streams Details**

When in display view, toggle this button to display performance details about each video tile:

- Video stream name and URI displayed in the video tile
- Current connection state
- Stream Resolution
- Current framerate and bitrate
- Network packet lost count (displayed only when one or more packets are lost)

- **Performance Graphs**

These graphs show the device's recent resource usage.

- CPU: shows the main processor's activity
- GPU: shows the graphics adapter's activity
- Mem: shows the system's RAM memory utilization
- Video: shows the video streaming data rate
- Eth: shows the traffic on the Ethernet interface

9 Device Configuration

Before the ION-R100S can be used on your video network, it must undergo an initial setup step during which its network configuration is determined. This initial configuration setup step is required so that the ION-R100S can communicate with computers and cameras on the network.

Once the initial network configuration step is completed, video output and connectivity settings will need to be set-up through the device's web interface. The device keeps this configuration within its internal memory and acts as a fully standalone video decoding & display appliance.

The initial network configuration can be performed directly on the device by connecting a keyboard and a mouse to the ION-R100S, or it can be performed remotely using a computer or laptop connected to the same network.

9.1 Network Configuration Basics

By factory default, the ION-R100S is configured in DHCP mode (Dynamic Host Configuration Protocol). In DHCP mode, when the device boots up, if it is connected to a network, it scans that network for a DHCP server. If a DHCP server is found on the network, the device requests that the DHCP server provide a unique network address and associated settings. The device then uses the DHCP-provided network configuration to communicate with other computers and cameras the network.

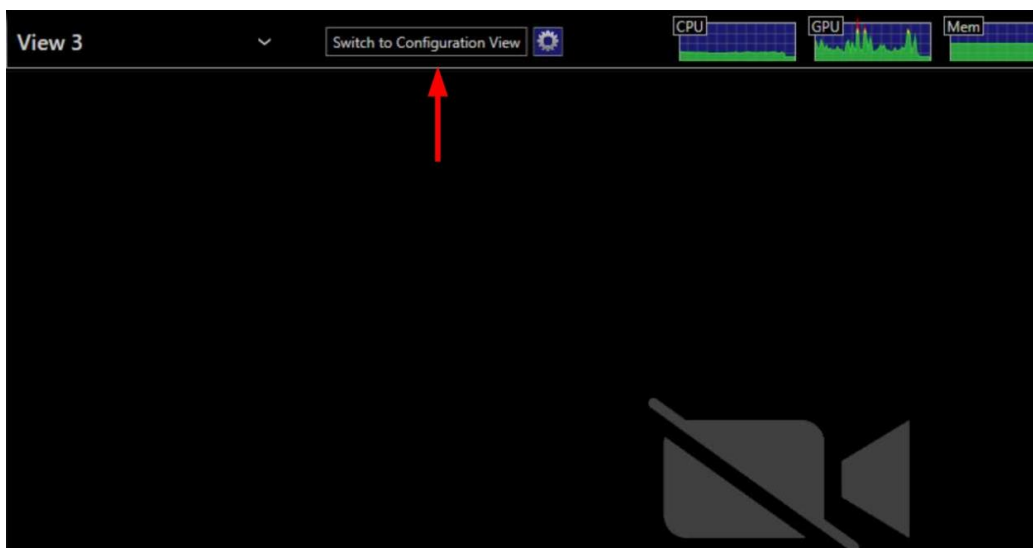
If no DHCP server is found on the network, the device switches to APIPA mode (Automatic Private IP Addressing). In this mode, the device automatically assigns itself a unique network address in the range 169.254.0.1 to 169.254.255.254 with subnet mask 255.255.0.0. APIPA mode ensures that devices in the APIPA network address range can communicate with one another.

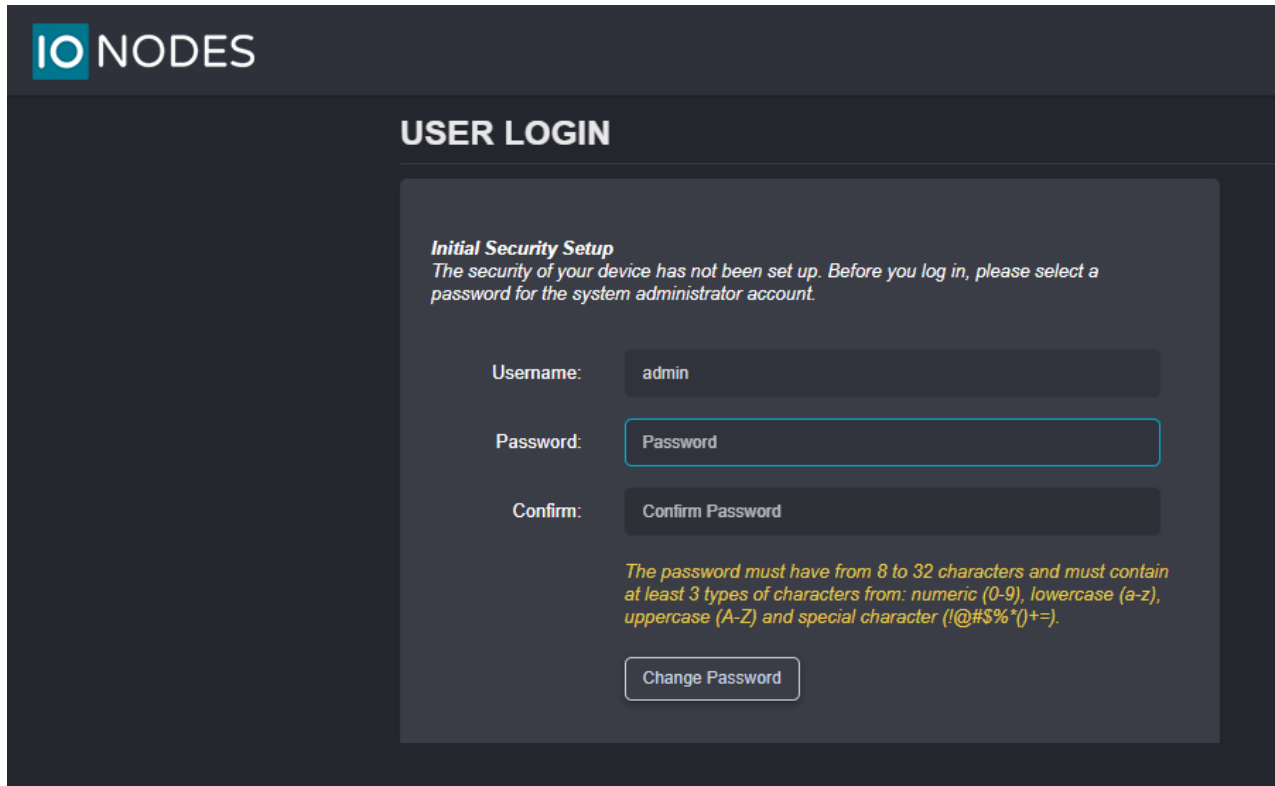
If computers and cameras on your network are not configured in APIPA mode, the ION-R100S will not be able to communicate with them while in APIPA mode. In such a case, the network configuration of the ION-R100S must be set manually.

When the network configuration is set manually, the ION-R100S skips all the steps above and always uses the user-provided configuration. It is then the responsibility of the user to ensure that the network configuration in the ION-R100S is compatible with the computers and cameras on the network.

9.2 Setting Up Initial Network Configuration Locally

The configuration of the ION-R100S can be accessed on the device itself, by switching to the Configuration View (using a connected USB keyboard & mouse).





IONODES

USER LOGIN

Initial Security Setup
The security of your device has not been set up. Before you log in, please select a password for the system administrator account.

Username:

Password:

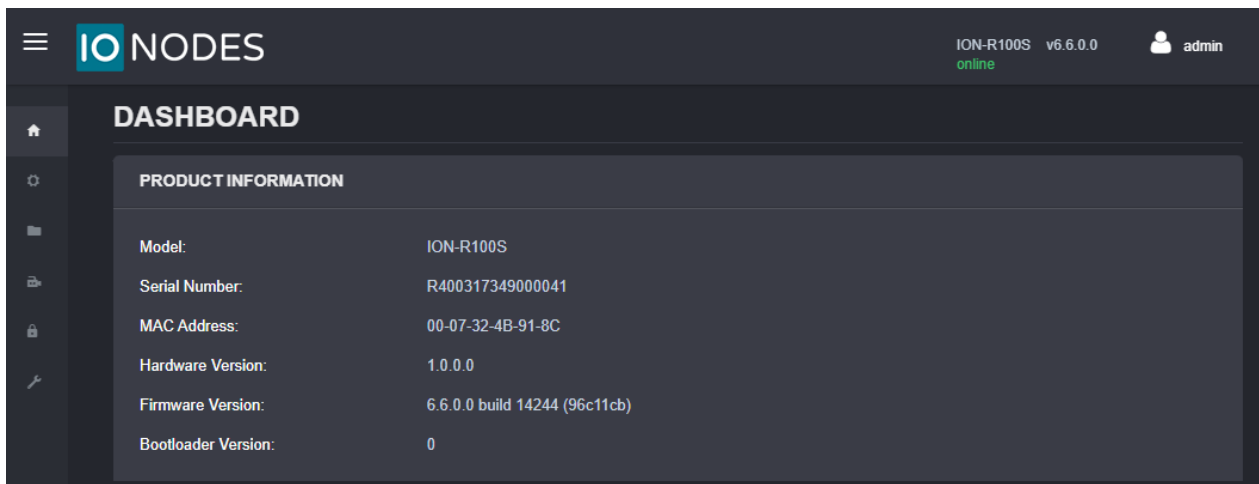
Confirm:


The password must have from 8 to 32 characters and must contain at least 3 types of characters from: numeric (0-9), lowercase (a-z), uppercase (A-Z) and special character (!@#%()*+=).*

[Change Password](#)

Upon first login, the user is prompted to select a password for the administrator account. The password must have from 8 to 32 characters and must contain at least 3 different types of characters from the following accepted types: numeric (0-9), lowercase (a-z), uppercase (A-Z) and special character (!@#%*()*+=). Please note that the same screen will also be displayed when doing the initial setup remotely, over the LAN.

The following screen is then displayed:



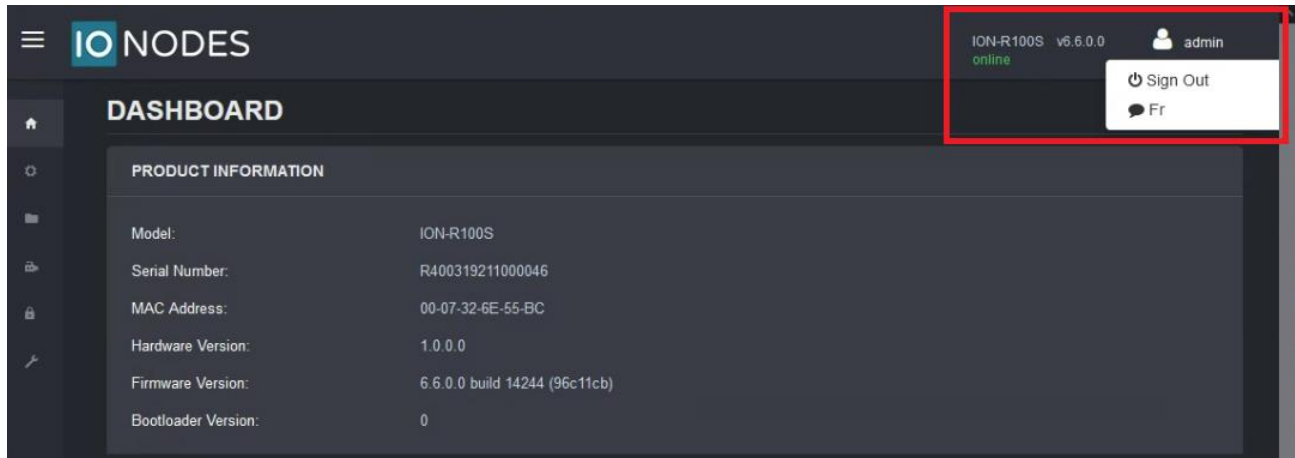
IONODES ION-R100S v6.6.0.0  admin
online

DASHBOARD

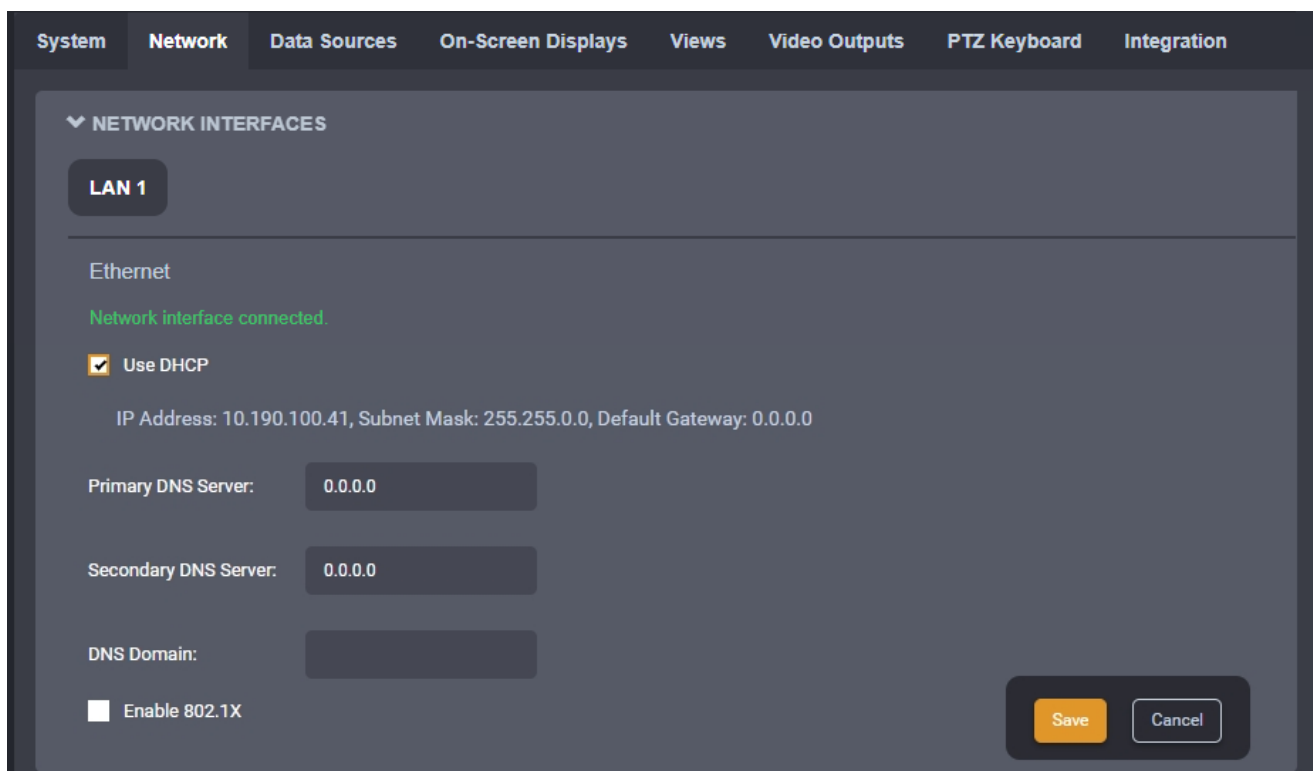
PRODUCT INFORMATION

Model:	ION-R100S
Serial Number:	R400317349000041
MAC Address:	00-07-32-4B-91-8C
Hardware Version:	1.0.0.0
Firmware Version:	6.6.0.0 build 14244 (96c11cb)
Bootloader Version:	0

You may now also select to change your web interface language from English to French if you so choose by clicking on the user icon and selecting **Fr**.



On the left side, select **Configuration**. The configuration interface is then displayed on the right side. Select the **Network** tab to display the network configuration.



The Ethernet network configuration is shown in the first section LAN 1. The first information displayed is the connection status of the Ethernet cable. If the configuration reports the network interface as not connected, check the Ethernet cable between the ION-R100S and the network before proceeding.

By default, the ION-R100S is configured in DHCP mode. If a DHCP server is present on the network, the network configuration provided by the DHCP server is displayed. In that case, nothing needs to be done; the device is ready to communicate with computers and cameras on your network.

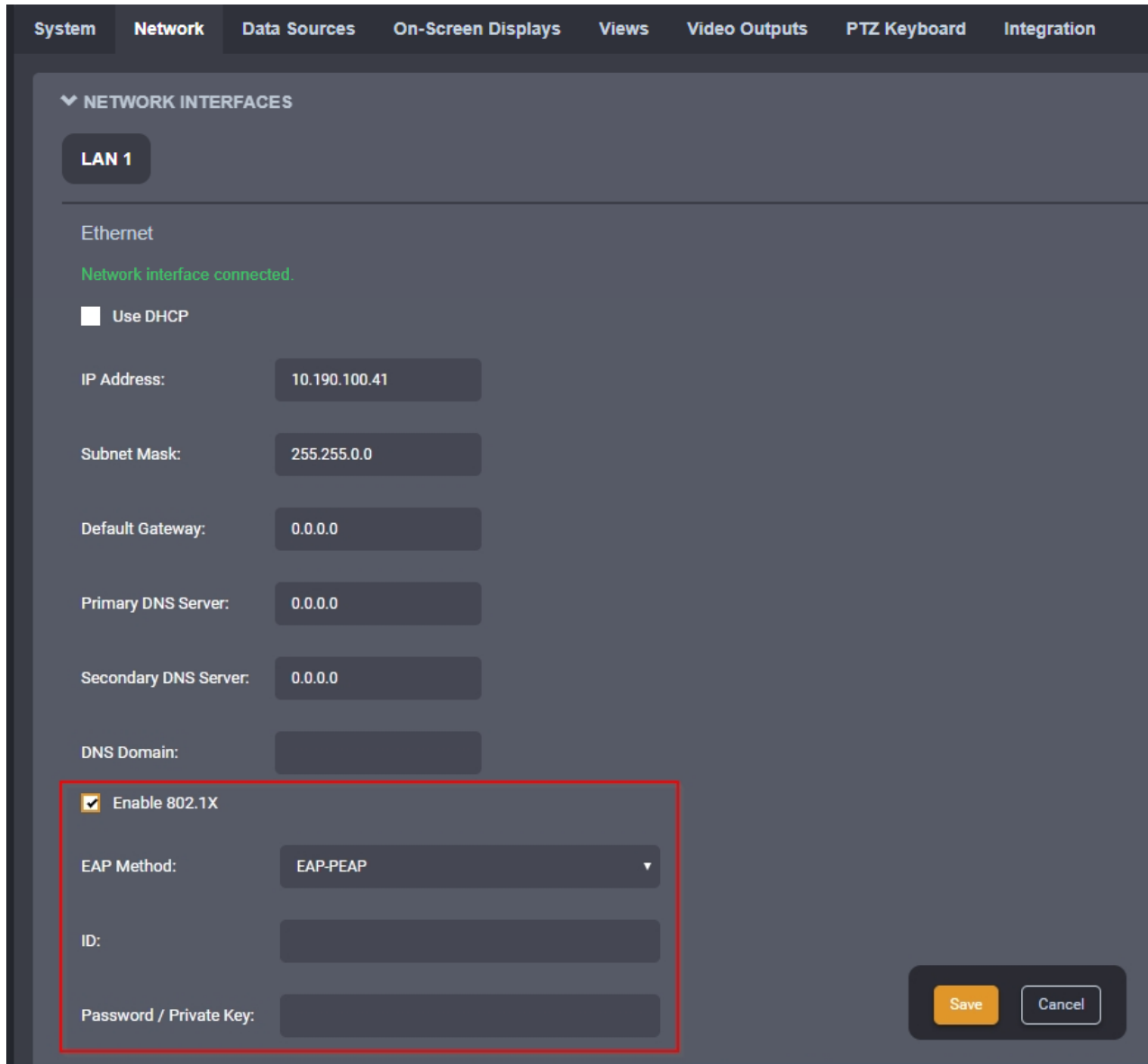
If the IP address shown is in the range 169.254.*.*, this means that the device could not obtain its network configuration from a DHCP server. In that case, the network configuration must be set manually.

To set the network configuration manually, uncheck **Use DHCP**. You can then enter each network setting separately. If you are unsure what values to enter, ask your network administrator to provide configuration settings compatible with your network. At a minimum, a valid **IP address** and **Subnet mask** must be entered. Once this is done, click on **Save** at the bottom to apply the configuration changes.

The screenshot shows the 'Network' tab in the IONODES web interface. Under 'NETWORK INTERFACES', the 'LAN 1' configuration is displayed. It shows an 'Ethernet' interface that is 'connected'. The 'Use DHCP' checkbox is unchecked. The 'IP Address' field contains '10.190.100.42', the 'Subnet Mask' is '255.255.0.0', and the 'Default Gateway' is '10.190.210.1'. The 'Primary DNS Server' and 'Secondary DNS Server' are both set to '0.0.0.0'. The 'DNS Domain' field is empty. The 'Enable 802.1X' checkbox is also unchecked. 'Save' and 'Cancel' buttons are at the bottom right.

Field	Value
IP Address	10.190.100.42
Subnet Mask	255.255.0.0
Default Gateway	10.190.210.1
Primary DNS Server	0.0.0.0
Secondary DNS Server	0.0.0.0
DNS Domain	

The R100S now supports 802.1x in EAP-PEAP mode. Make sure to check the Enable 802.1x box and then enter the required information.



System Network Data Sources On-Screen Displays Views Video Outputs PTZ Keyboard Integration

▼ NETWORK INTERFACES

LAN 1

Ethernet

Network interface connected.

☐ Use DHCP

IP Address: 10.190.100.41

Subnet Mask: 255.255.0.0

Default Gateway: 0.0.0.0

Primary DNS Server: 0.0.0.0

Secondary DNS Server: 0.0.0.0

DNS Domain:

☒ Enable 802.1X

EAP Method: EAP-PEAP ▼

ID:

Password / Private Key:

Save Cancel

ID: Enter the username in 802.1x ID field for authentication

Password / Private Key: Enter the password in 802.1x Password field for authentication.

Click **Save**

The device is now ready to communicate with computers and cameras on your network.

9.3 Setting Up Initial Network Configuration Remotely

Initial device network configuration can also be done via the ION Configuration Tool (ICT), a tool provided by IONODES and that can be found on the IONODES web site at www.ionodes.com.

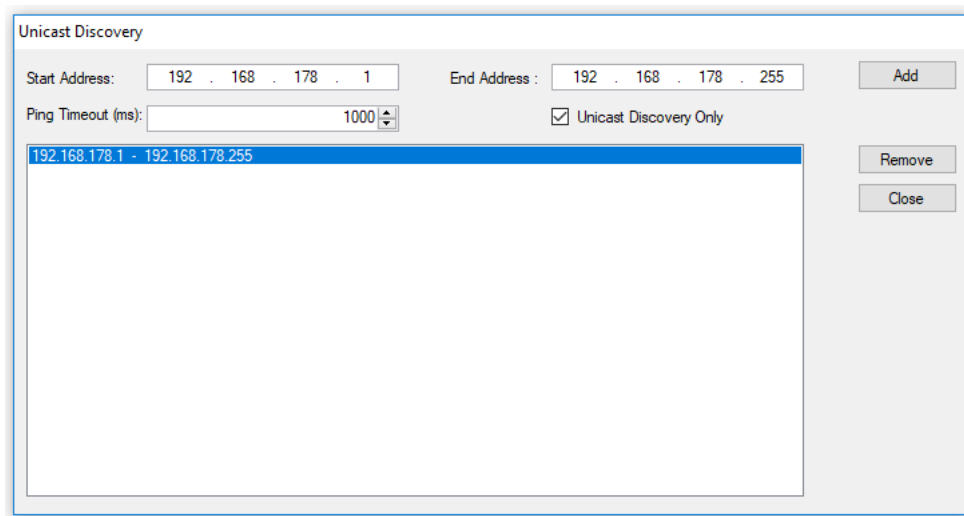
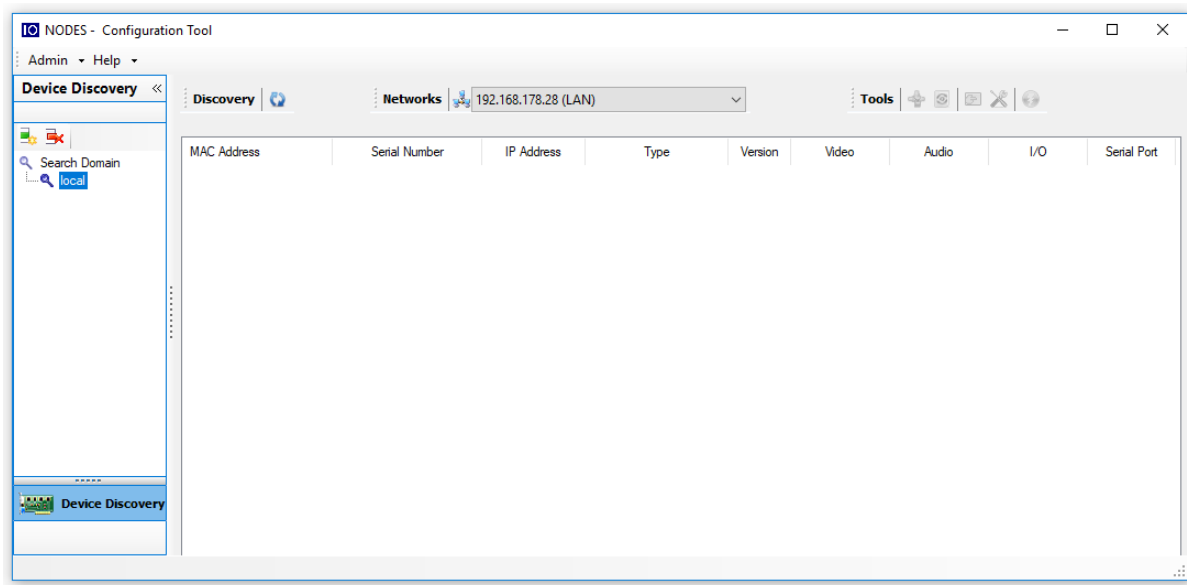
The ICT plays several roles:

1. Discovery of all ION-R100S and other IONODES devices on the network
2. Remote configuration of the IP address and subnet mask
3. Applying batch firmware upgrade of all common IONODES devices
4. Accessing a device's web-based management interface

Once your device is installed on your network and powered up, launch the ICT from any computer located on the same network as the device.

The ICT supports 2 methods for discovering a device on the network. The first method doesn't require any configuration and uses the Bonjour discovery protocol. To be able to discover a device via Bonjour, the network must support multicast IP.

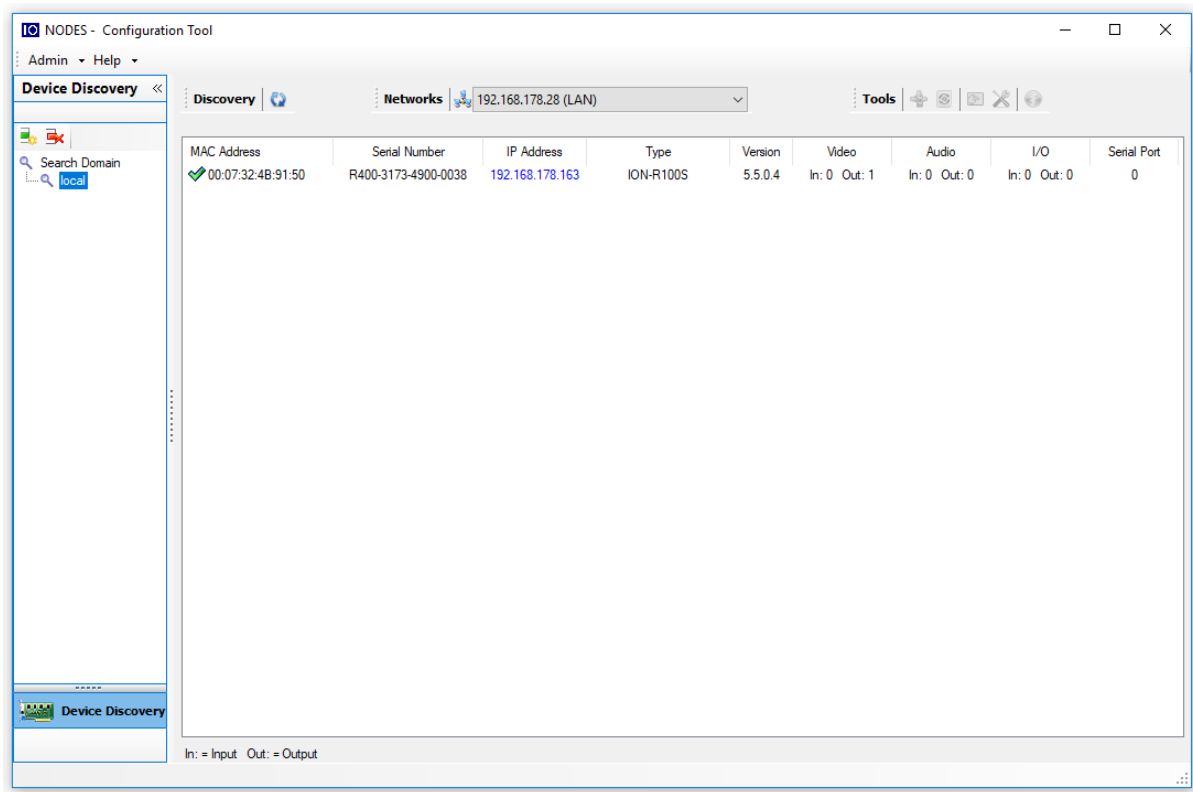
If multicast is not supported, you can use the second method: Unicast Discovery. Unicast Discovery can be configured by using the "Unicast Discovery" menu option under the Admin menu list.



To configure Unicast Discovery, add one or more IP address ranges. Unicast Discovery will attempt to reach a device at a specific IP address in the configured ranges. Discovery can be a long process if the range of IP addresses is large. To accelerate the discovery, add several small ranges of IP addresses.

The ping timeout option can be increased for a high latency network.

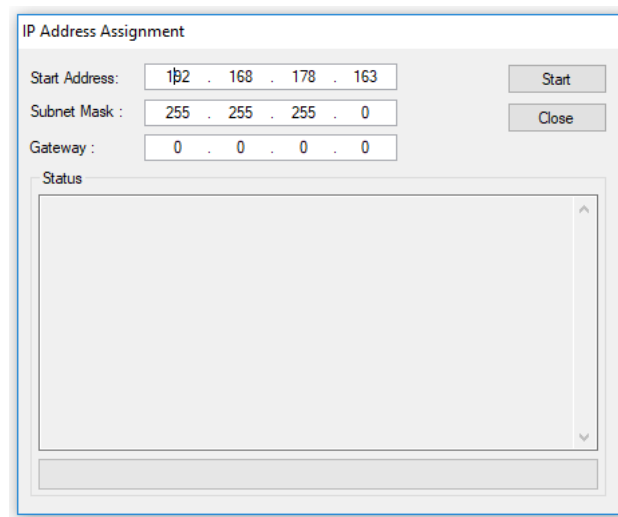
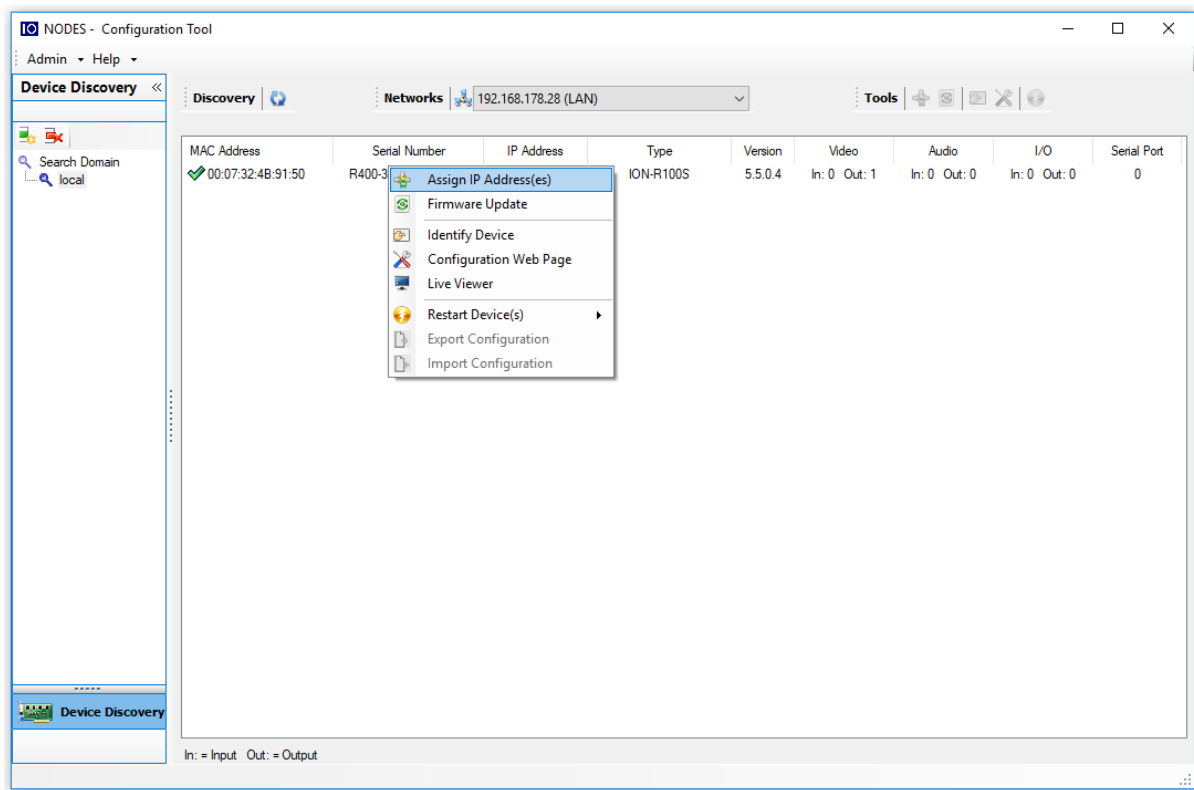
The ICT will display as many devices as it discovers on the network.



The ICT displays the current IP address of each detected device. If the device is configured in DHCP mode, its IP address appears in blue.

If a DHCP server is present on your network, it assigned an IP address to the device during the device's boot-up sequence.

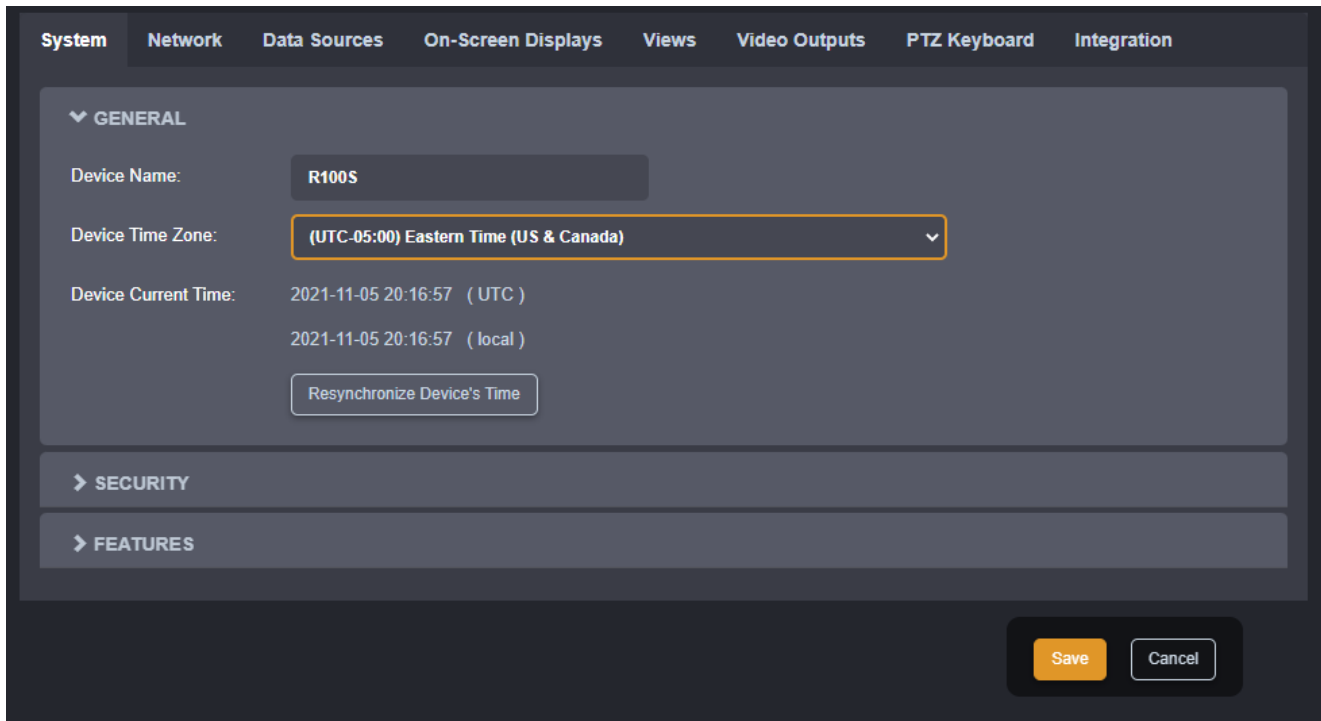
If no DHCP server was able to assign an IP address to an ION-R100S, it will appear in the ICT device list with an APIPA address (169.254.*.*). If an ION-R100S displays an APIPA address it must be configured with a valid IP address before it can be used on the network. Select the "Assign IP address" from the selection list and apply the desired TCP/IP settings to the device.



Once the network settings are set, the web-based configuration interface of the ION-R100S can be launched from the ICT or directly in your web browser by typing the device's IP address in the address bar.

9.4 Setting up Time

In the **Configuration** page, select the **System** tab and expand the first section, **General**.



The screenshot shows the IONODES Configuration interface. At the top, there are tabs: System, Network, Data Sources, On-Screen Displays, Views, Video Outputs, PTZ Keyboard, and Integration. The 'System' tab is selected. Below the tabs, the 'GENERAL' section is expanded, showing the following fields:

- Device Name:** R100S
- Device Time Zone:** (UTC-05:00) Eastern Time (US & Canada) (dropdown menu)
- Device Current Time:** 2021-11-05 20:16:57 (UTC)
2021-11-05 20:16:57 (local)

Below these fields, there is a button labeled 'Resynchronize Device's Time'. At the bottom of the configuration panel, there are two buttons: 'Save' and 'Cancel'.

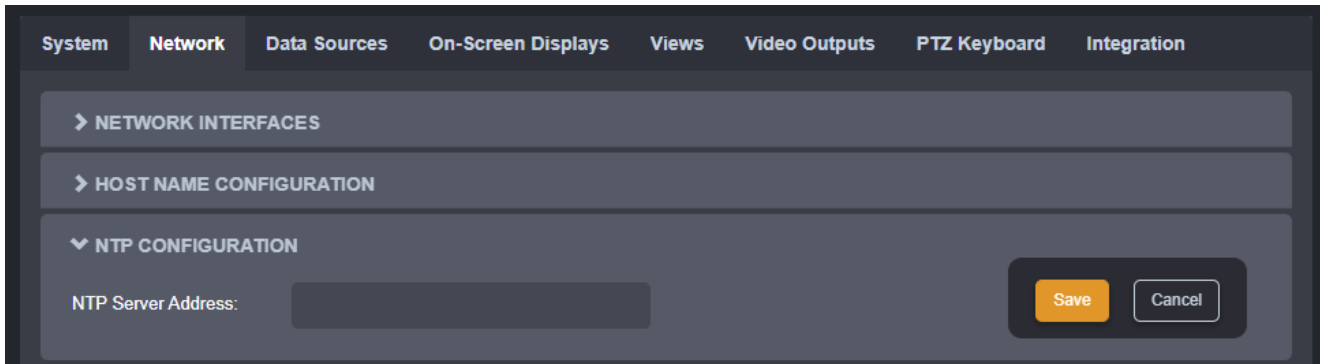
To set the time zone in the device, select the appropriate value from the list in **Device Time Zone** and then click on **Resynchronize Device's Time**.

Click the **Save** button to apply the changes.

9.4.1 Setting up NTP time server

Some networks use a time server, also named NTP time server (Network Time Protocol). The role of a time server is to synchronize the time for all devices on the network. The ION-R100S can be configured to use such a time server to synchronize its internal clock.

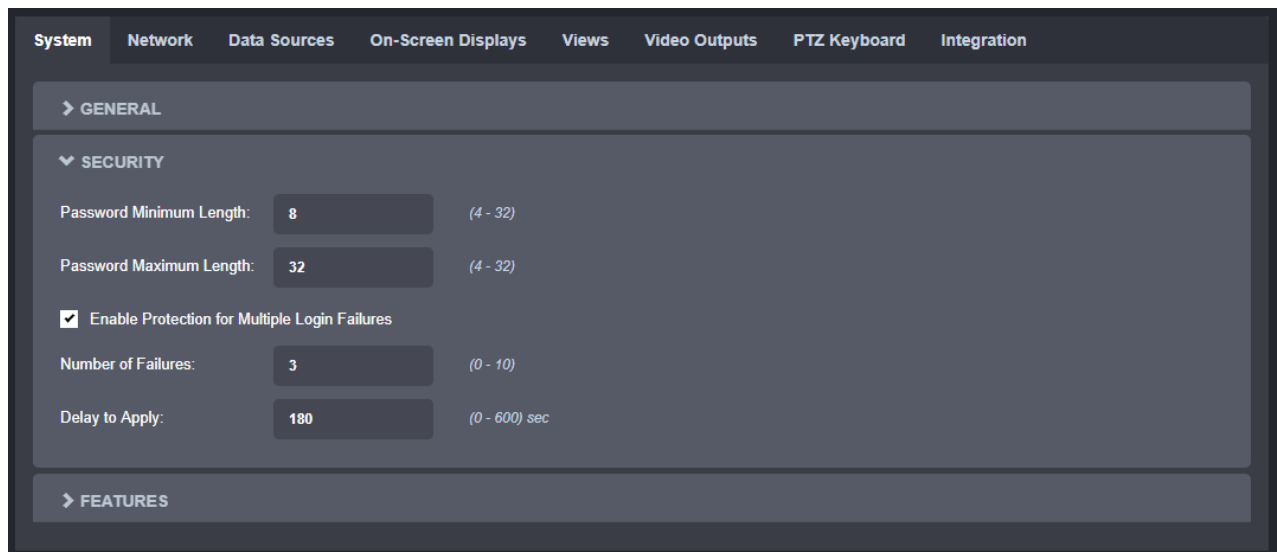
In the **Configuration** page, select the **Network** tab and scroll down to the **NTP Configuration** section. Set the proper NTP server address under the **NTP Server address**. Click the **Save** button to apply the changes.



9.5 Setting up Security Policy

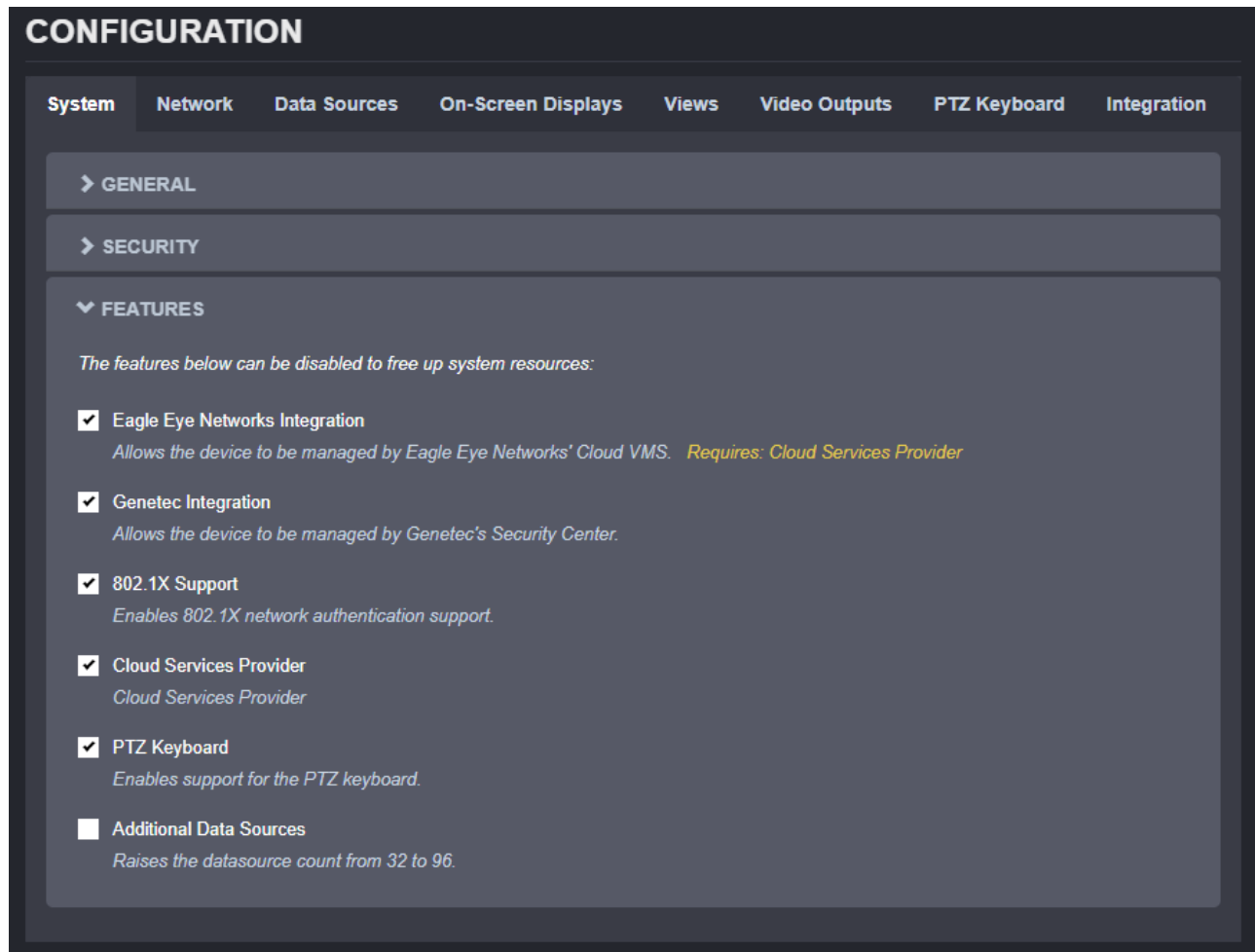
In the **Configuration** page, select the **System** tab and go down to the section **Security**.

Here the user can define the minimum & maximum length of the password for all user accounts. By validating the option “*Enable Protection for Multiple Login Failures*”, the device is instructed to block all login attempts after *X* failed ones, until the timeout of *Y* seconds runs out (*X* and *Y* are user-configurable).



9.6 Configuring System Features

In the **Configuration** page, select the **System** tab and go down to the section **Features**.



For each feature a brief description is provided.

Enabling/disabling a feature will require a reboot of the device, so that the corresponding service is started/stopped. During this entire process, the device will constantly offer feedback to the user, up to the point where the reboot is completed and the login page reappears.

Note: Enabling “*Additional Data Sources*” will increase the number of datasources that can be configured from the default 32 to 96. When going back from 96 to 32 (by disabling the feature), all data sources above 32 will be lost.

FEATURES

The features below can be disabled to free up system resources:

- ☒ Eagle Eye Networks Integration
Allows the device to be managed by Eagle Eye Networks' Cloud VMS. *Requires: Cloud Services Provider*
- ☒ Genetec Integration
Allows the device to be managed by Genetec's Security Center.
- ☒ 802.1X Support
Enables 802.1X network authentication support.
- ☒ Cloud Services Provider
Cloud Services Provider
- ☒ PTZ Keyboard
Enables support for the PTZ keyboard.
- ☒ Additional Data Sources
Raises the datasource count from 32 to 96.

Updating the features requires a reboot.
Save & Reboot
Cancel

IONODES

offline Fr

USER LOGIN

Username:
Password:

Features have been saved. Please wait for the device to reboot.

IONODES

online Fr

USER LOGIN

Username:
Password:

9.7 Video Configuration Concepts

In the **Configuration** page, there are multiple tabs for configuring the device. In this section, we will revise those pertaining to the video aspect of the R100S. Here is a quick overview before we go into details for each tab.

- Data Sources
- On-Screen Displays
- Views
- Video Out

Data Sources represent connections to external devices or cameras. Several types of connections are available: video streams over RTSP, passive RTP and HTTP as well as web pages. The ION-R100S supports up to 32 separate data sources.

On-Screen Displays (OSD) determine the information you want to display over video streams and how to display that information. For example, when displaying a video stream, you might want to display the camera name and current time over the video. The ION-R100S supports up to 32 separate OSD configurations.

Views determine how you want to group and display data. For example, if you wanted to display video from all the building entrances on one screen in a 2x2 layout, you could configure a view to do so. The ION-R100S supports up to 8 separate views. In addition to that, it also supports 4 Sequence modes.

Finally, the **Video Outputs** tab contains the configuration specific to the monitor connected to the ION-R100S, like the display resolution for example. The ION-R100S supports a single display output (HDMI).

9.8 Configuring Video Connections

9.8.1 Video over RTSP Data Sources

In the **Configuration** page, select the **Data Sources** tab. After that, select the data source you want to configure from the drop-down list. To configure an RTSP video connection, set **Data Source Type** to *Video over RTSP*.

The screenshot shows the 'Data Sources' configuration page in the IONODES interface. The top navigation bar includes 'System', 'Network', 'Data Sources' (selected), 'On-Screen Displays', 'Views', 'Video Outputs', and 'Integration'. Below the navigation bar, the 'DATA SOURCE SELECTION' section is expanded. It features a 'Select Data Source:' dropdown menu with '8: Data Source 8' selected. Below this is an 'Enabled' checkbox. The 'Name:' field is 'Data Source 8'. The 'Data Source Type:' dropdown is set to 'Video over RTSP', with a button 'Configure Data Source Using the Discovery Wizard' below it. The 'Stream Mode:' dropdown is set to 'RTSP/UDP (Multicast or Unicast)'. There are input fields for 'Username:', 'Password:', and 'Connection URI:'. A 'Test Connection' button is located below the 'Connection URI' field. The 'Decoding Priority:' dropdown is set to 'Video Smoothness'. At the bottom right, there are 'Save' and 'Cancel' buttons.

To connect to a video stream, the ION-R100S needs to know the **Connection URI** and **Stream Mode**, as well as any **Username** and **Password** required by the camera or encoder. If you know the exact connection URI of the video stream, you can type it in manually. Or you can use the discovery wizard by clicking on [Configure Data Source Using Discovery Wizard](#). The discovery wizard guides you through a few simple steps to fill the data source configuration for you.

Step 1 – Camera Discovery

The wizard then displays a list of all cameras and encoders on the network. If the camera you are looking for does not appear in the list, make sure the camera is connected to the network and press [Refresh](#).

CONFIGURATION

1. Camera Discovery 2. Video Profile Selection 3. Summary

Sort By: [IP Address](#) / [Camera Name & Model](#)

☐ Hide Cameras Already Selected [Refresh](#)

Name:	HIKVISION DS-2CD2023G0-I	Address:	10.190.0.216
Model:	DS-2CD2023G0-I	Type:	OnVif
Name:	Bosch	Address:	10.190.40.6
Model:	FLEXIDOME_IP_micro_5000_HD	Type:	OnVif
Name:	SND-L6013R	Address:	10.190.40.8
Model:	SND-L6013R	Type:	OnVif
Name:	SUP_MINI_LVDS	Address:	10.190.100.10
Model:	ATOMAS-MINI	Type:	OnVif
Name:	SUP_DUAL_AR0	Address:	10.190.100.11
Model:	ATOMAS-MINI	Type:	OnVif

Username: Password:

[Next >](#) [Cancel](#)

[Test Connection](#)

Decoding Priority: [Video Smoothness](#)

Step 2 – Camera Selection

Select the camera you want by clicking on the desired entry in the list. Then, enter the **Username** and **Password** required to connect to the camera. Press the **Next** button.

CONFIGURATION

1. Camera Discovery 2. Video Profile Selection 3. Summary

Sort By: [IP Address](#) / [Camera Name & Model](#)

☐ Hide Cameras Already Selected [Refresh](#)

Name:	HIKVISION DS-2CD2023G0-I	Address:	10.190.0.216
Model:	DS-2CD2023G0-I	Type:	OnVif
Name:	Bosch FLEXIDOME_IP_micro_5000_HD	Address:	10.190.40.6
Model:		Type:	OnVif
Name:	SND-L6013R	Address:	10.190.40.8
Model:	SND-L6013R	Type:	OnVif
Name:	SUP_MINI_LVDS ATOMAS-MINI	Address:	10.190.100.10
Model:		Type:	OnVif
Name:	SUP_DUAL_AR0	Address:	10.190.100.11
Model:		Type:	OnVif

Username: Password:

[Next >](#) [Cancel](#)

[Test Connection](#)

Decoding Priority: [Video Smoothness](#)

Step 3 – Video Profile Selection

In this step, the wizard displays a list of all video streams available from the camera that are supported by the ION-R100S. Click on the desired video stream. The **Stream Mode** field shows a list of network connections supported by the camera. Select the desired streaming mode and press **Next**. You can also check **Enable PTZ** to have access to PTZ controls when viewing video from the camera.

1. Camera Discovery 2. Video 3. Summary

Camera: TKH Security Solutions (10.190.40.82) [Refresh](#)

Encoding:	H264	Format:	1920x1080, 30 fps, 4096 kbps
Stream Mode:	RTSP/UDP (Multicast or Unicast)		
Enable PTZ:	<input checked="" type="checkbox"/>		

Encoding:	MJPEG	Format:	
Stream Mode:	RTSP/UDP (Multicast or Unicast)		
Enable PTZ:	<input type="checkbox"/>		

< Back Next > Cancel

Note: If you entered a wrong username or password in the previous step, the wizard displays a warning indicating that it can't retrieve the video profiles. In this case, press the **Back** button to go back and enter the correct username and password.

Note: You won't see the option **Enable PTZ** if the camera doesn't support it over ONVIF.

Step 4 – Summary

Here the wizard displays the details of the video stream you have selected. To confirm that this is the video stream that you want, click on **Done**. The wizard then closes, and the data source configuration is automatically populated.

1. Camera Discovery
2. Video
3. Summary

Camera

Name: TKH Security Solutions
Model: HSD820v2H3-E
Address: 10.190.40.82

Stream

Encoding: H264
Format: 1920x1080, 30 fps, 4096 kbps
Stream Mode: RTSP/UDP (Unicast Only)
Stream URL: rtsp://10.190.40.82/h264

Options

Enable PTZ: true

< Back
Done
Cancel

To finalize the data source configuration, type in a name (optional) for the data source and press **Save** at the bottom to save the new configuration.

System
Network
Data Sources
On-Screen Displays
Views
Video Outputs
Integration

DATA SOURCE SELECTION

Select Data Source: 19: TKH Direct

☒ Enabled

Name: TKH Direct

Data Source Type: Video over OnVif/RTSP

Configure Data Source Using the Discovery Wizard

Default credentials for the camera discovery wizard

Stream Mode: RTSP/UDP (Unicast Only)

Username: Admin

Password: ****

Connection URI: rtsp://10.190.40.82/h264

Decoding Priority: Video Smoothness

☒ PTZ Enabled

Test Connection

Save Cancel

Note: The ION-R100S connects to a video stream **ONLY** when that video stream is displayed. Enabling a data source indicates that the ION-R100S can establish this connection when needed, not that it needs to do so right away. Disabling a data source prevents the ION-R100S from connecting to the video stream for any reason.

Note: A video data source creates a single connection. Even if the video is played on two different tiles at the same time, the video stream is captured only once.

9.8.2 Testing a connection

Once the data source is fully configured and saved, press the **Test Connection** button to test the connection.

Possible results are:

- **Connection attempt successful.**
No error was reported while testing the connection.
- **Connection attempt timed out.**
Tried to connect to the camera but got no answer. The camera may be temporarily offline, else it is unreachable.
- **Connection attempt refused by remote.**
The connection to the camera was established, but the camera refused the username/password provided.
- **Connection established, but unable to start video stream.**
The connection to the camera was established, but the video stream could not be started. The connection URI may not point to a valid video stream in the camera. This can also occur if the camera has reached a connection or streaming limit due to other third-party connections.
- **Invalid connection URI or internal error, connection attempt impossible.**
The connection URI is malformed or incomplete.

DATA SOURCE SELECTION

Select Data Source: 8: Bosch

☒ Enabled

Name: Bosch

Data Source Type: Video over RTSP

Configure Data Source Using the Discovery Wizard

Stream Mode: RTSP/UDP (Unicast Only)

Username: service

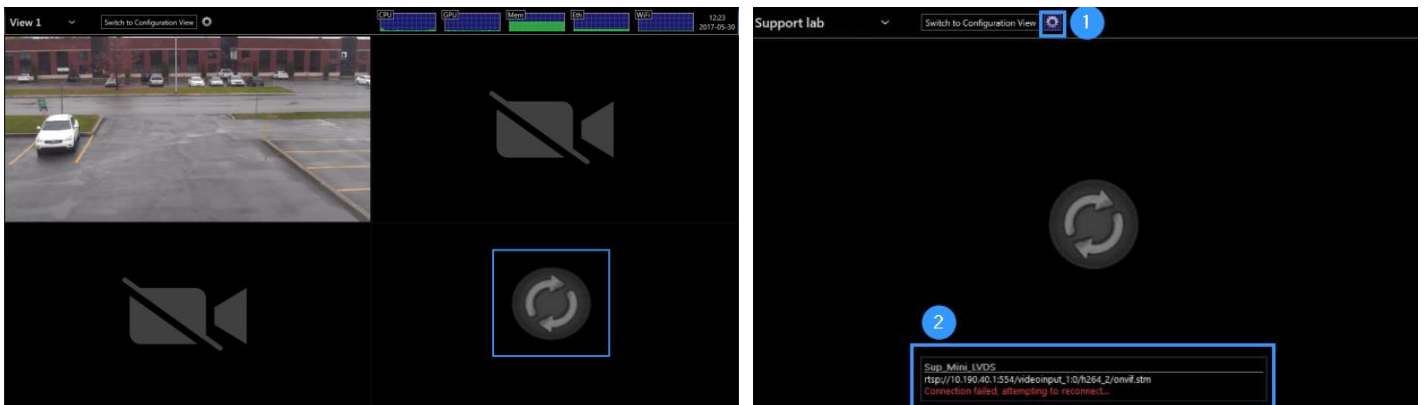
Password:


Connection URI: rtsp://10.190.40.6/rtsp_tunnel?h26x=4&line=1&inst=1

Test Connection Connection attempt successful.

Decoding Priority: Video Smoothness

Note: Connection testing is only available for *Video over RTSP* and *Video over HTTP* data sources.



Note: For security reasons, any time an invalid URI is configured in a Data Source or loss of a video stream occurs for any other reason (i.e. camera defect, network issues, etc.) an animated rotating circle icon will appear to indicate a connection loss for that Data Source as depicted in the bottom right tile of the graphic on the left above. No connection information, such as IP address or other URI parameters will be displayed. The graphic on the right shows that you can display this information by activating the stream details by clicking on the  button at the top of the screen when a mouse is directly connected to the ION-R100S.

9.8.3 Video over HTTP Data Sources

To configure an MJPEG over HTTP video connection, set **Data Source Type** to *Video over HTTP*. There is no standardized method to query the list of available HTTP video streams in a camera and thus the discovery wizard cannot be used to configure the data source. You must enter the **Connection URI** as well as any **Username** and **Password** required by the camera. If you do not know the **Connection URI** to use, see your camera documentation or contact the camera manufacturer.

The screenshot shows the 'Data Sources' tab in the IONodes configuration interface. The 'DATA SOURCE SELECTION' section is expanded, showing a dropdown menu for 'Select Data Source' with '10: Kitchen entrance' selected. Below this, the 'Enabled' checkbox is checked. The 'Name' field is 'Kitchen entrance'. The 'Data Source Type' dropdown is set to 'Video over HTTP'. The 'Username' field is 'service' and the 'Password' field is masked with '*****'. The 'Connection URI' field contains 'http://10.190.40.6/snap.jpg?JpegSize=M&JpegCam=1'. A 'Test Connection' button is present, and a yellow message 'Connection attempt successful.' is displayed. The 'Decoding Priority' dropdown is set to 'Video Smoothness'.

9.8.4 Video over Passive RTP Data Sources

Some legacy video systems use video over passive connections. In this mode, the camera just sends the video to a fixed IP address or multicast group address without knowing if there is somebody to receive the video.

To configure a passive video connection, set **Data Source Type** to *Video over Passive RTP*, and then set the **Stream Mode** and **Stream Port** to match the passive video stream. If the passive video is sent to a multicast group, you must also enter the **Stream Multicast Group**. If the passive video is sent using SSM (Source-Specific Multicast), you must enter the **Stream Multicast Group** and **Stream Source**.

System Network **Data Sources** On-Screen Displays Views Video Outputs Integration

▼ DATA SOURCE SELECTION

Select Data Source: 8: Bosch ▼

☒ Enabled

Name: Bosch

Data Source Type: Video over Passive RTP ▼

Stream Mode: RTP/UDP (Multicast) ▼

Stream Multicast Group: 224.16.17.2

Stream Port: 47806

Decoding Priority: Video Smoothness ▼

9.8.5 Decoding Priority

Setting **Decoding Priority** will determine how your video stream will be displayed upon arrival within the device.

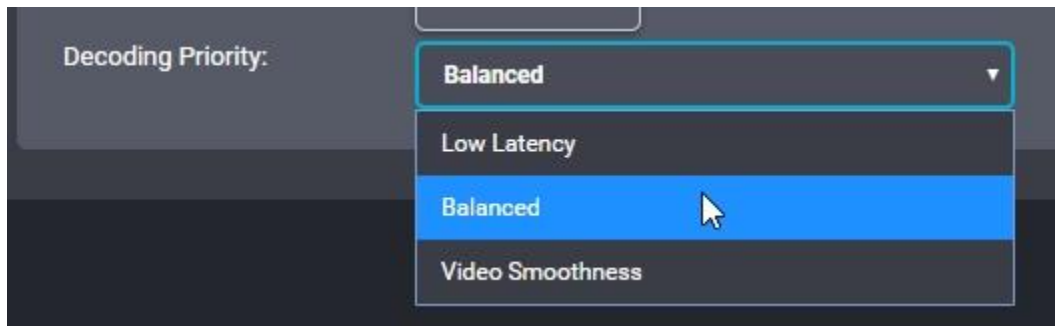
Low Latency – the video will be displayed upon the very arrival of the first frame received. As the name implies, this setting will guarantee the lowest latency possible, however, any frame transmission delay could affect video fluidity.

Balanced – A 100ms buffer is added to the stream. Just the right mix of **Low Latency** and **Video Smoothness** settings, this setting should be sufficient to correct any normally occurring frame timing variations originating from the data source or which might be network induced.

Video Smoothness – A 250ms buffer is added to the incoming video stream before it is displayed. Although this implies a minimal latency, it also ensures an almost perfect video playback.

The screenshot shows the 'Data Sources' configuration page in IONodes. The 'Decoding Priority' dropdown menu is highlighted with a red rectangle. The configuration details are as follows:

Field	Value
Select Data Source:	1: SUP_MINI_LVDS
Enabled	<input checked="" type="checkbox"/>
Name:	SUP_MINI_LVDS
Data Source Type:	Video over RTSP
Stream Mode:	RTSP/UDP (Multicast Only)
Username:	poweruser
Password:	*****
Connection URI:	rtsp://10.190.100.10:554/videoinput_1:0/h264_1/onvif.stm
Decoding Priority:	Video Smoothness

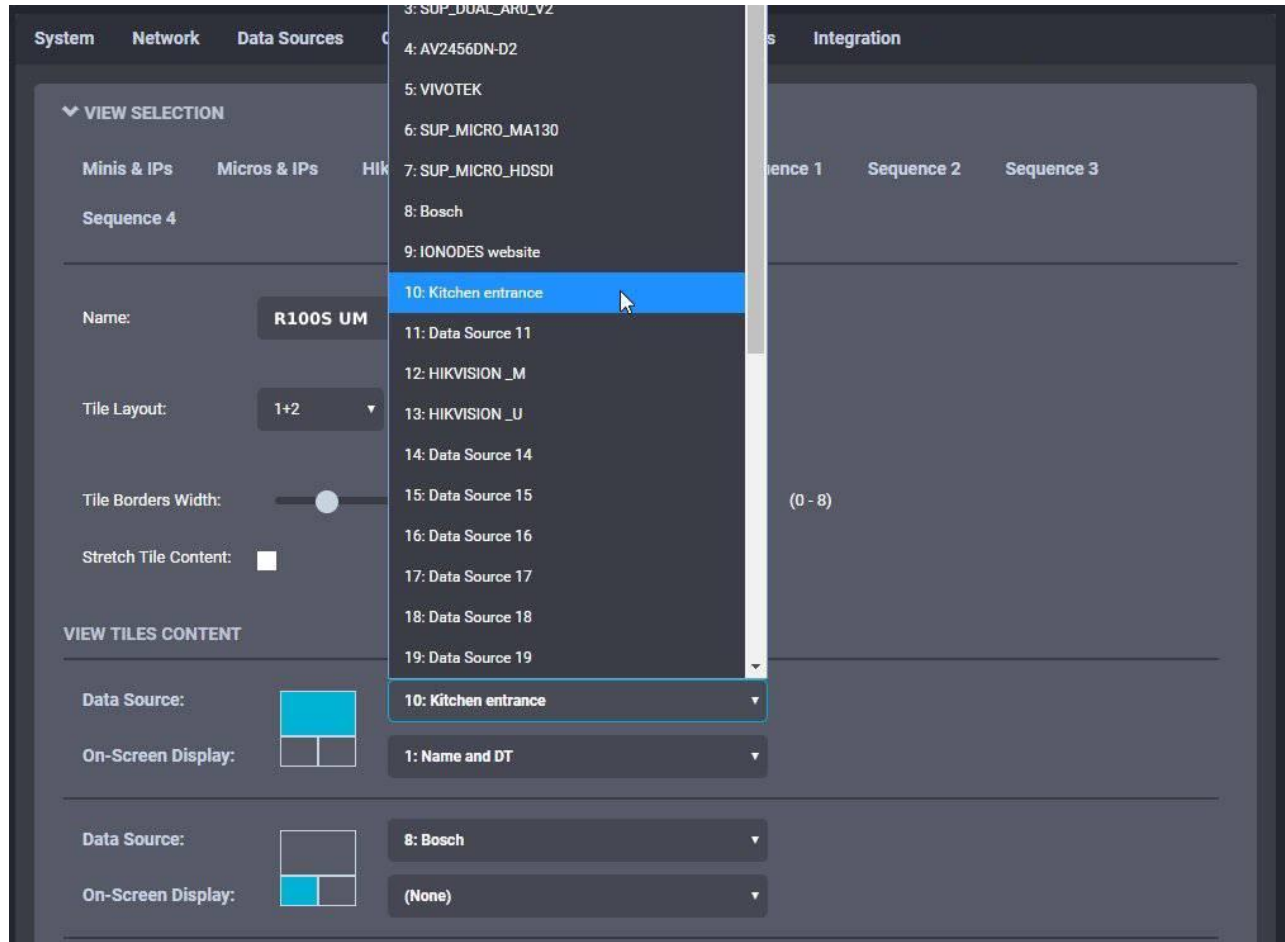


9.8.6 Displaying a Data Source

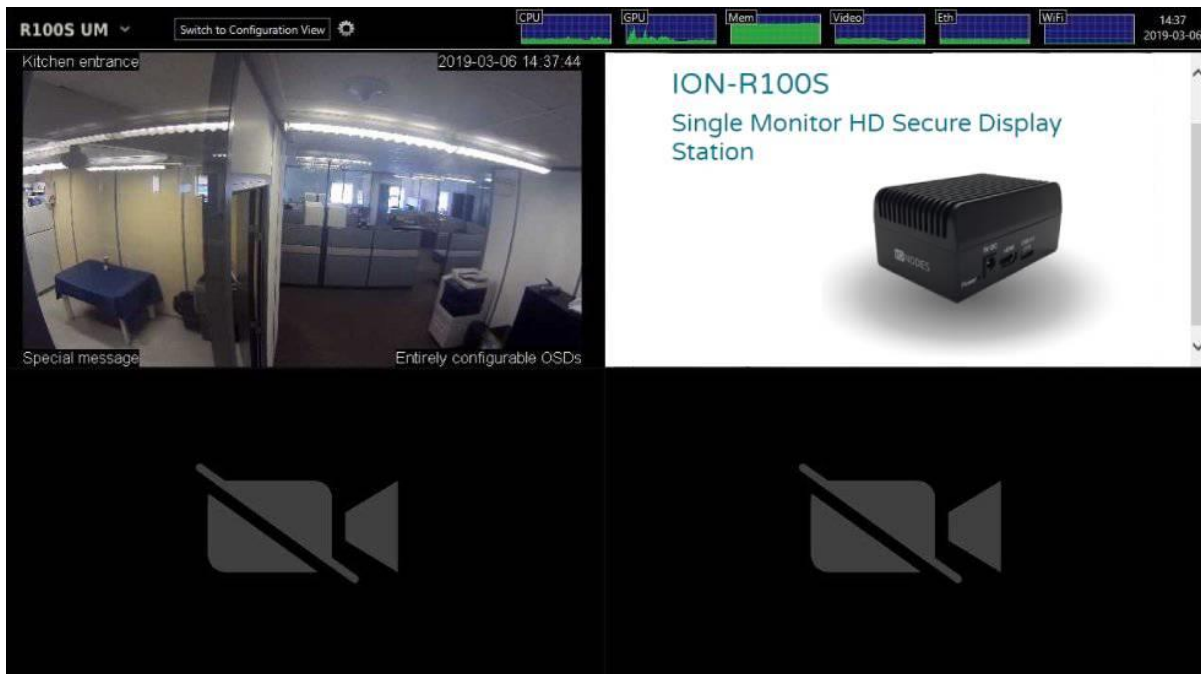
Now that we have configured an RTSP video data source, the next step is to display it. In the **Configuration** page, select the **Views** tab.

Views determine how data sources are grouped and displayed. For example, by default each view displays up to 4 data sources in a 2x2 layout. How to configure views will be discussed in full details in section 9.12. For now, scroll down to the **View Tiles Content** section. Each tile is identified by its position in the currently selected layout.

For the top left tile, click on the **Data Source** field and select our newly configured video data source. Click on **Save** at the bottom to apply the change.



If you are configuring the ION-R100S from your computer through the device's web interface, the video is now displayed. If you are configuring the ION-R100S locally, click on **Switch to Display View** at the top of the screen to view the video.



9.8.7 On-Screen Displays

In the **Configuration** page, select **On-Screen Displays** tab.

Screen Preview is a visual representation of the area where the OSD will be displayed. As you configure the OSD, the preview will be automatically updated. Each OSD can display up to 4 strings of text, located as you wish over the video.

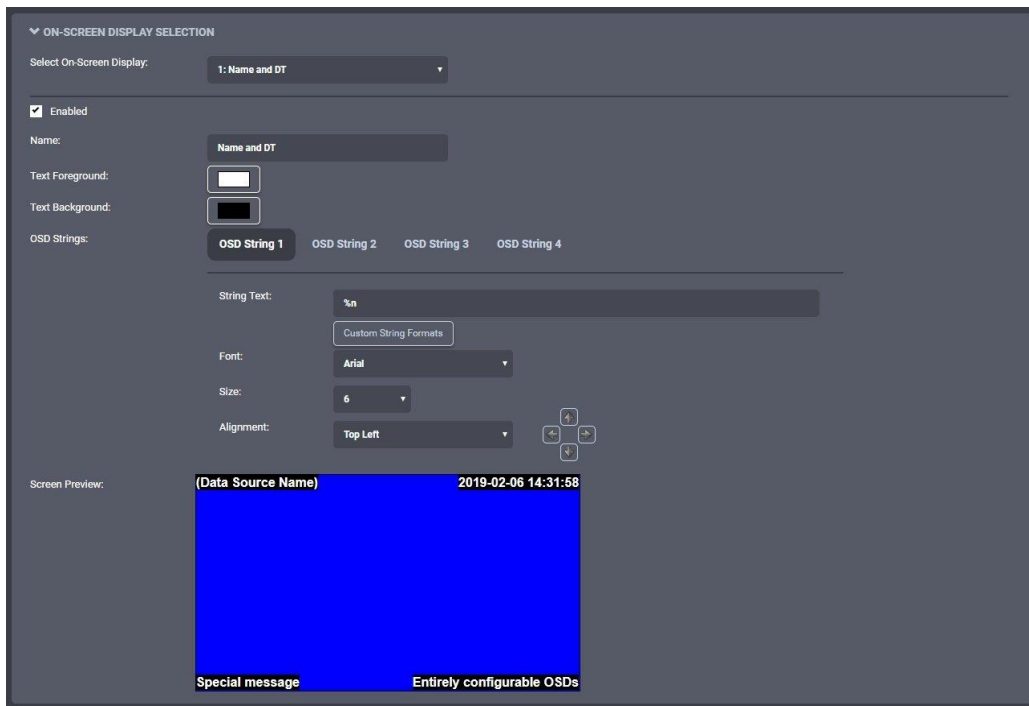
The screenshot shows the 'ON-SCREEN DISPLAY SELECTION' configuration window. At the top, there's a dropdown for 'Select On-Screen Display:' set to '1: Name and DT'. Below this is a checked 'Enabled' checkbox. The 'Name:' field is set to 'Name and DT'. There are color pickers for 'Text Foreground' (white) and 'Text Background' (black). Under 'OSD Strings', there are four tabs: 'OSD String 1', 'OSD String 2', 'OSD String 3', and 'OSD String 4'. The 'OSD String 1' tab is active, showing a 'String Text' field with 'Entirely configurable OSDs', a 'Custom String Formats' button, a 'Font' dropdown set to 'Arial', a 'Size' dropdown set to '6', and an 'Alignment' dropdown set to 'Bottom Right'. To the right of these are four directional arrows for offset. At the bottom, a 'Screen Preview' shows a blue rectangle with the text '(Data Source Name)' in the top left, '2019-02-06 14:33:46' in the top right, 'Special message' in the bottom left, and 'Entirely configurable OSDs' in the bottom right.

Click on **Text Foreground** to select the color of the OSD text. In the same fashion, click on **Text Background** to select the background color for the OSD text.

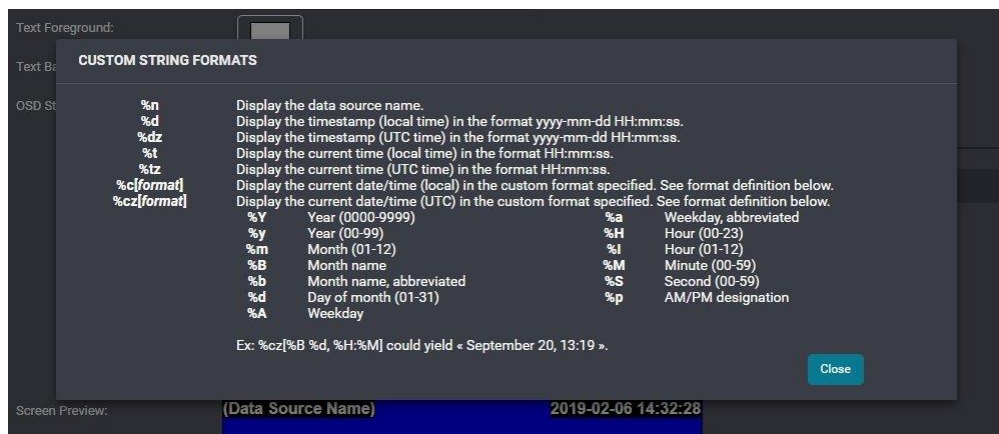
Above the preview is where you configure each OSD string. Click on the **OSD String 1** to configure the first OSD string. In **String Text**, type in the text to display. Select the desired **Font**, you have a choice of either Arial (used throughout this manual) or Impact. **Text Size** lets you select how big to display the text. Finally, **Alignment** lets you select where to anchor the text (ex: top left corner). Use the **Offset** arrows if you want to move the text around that anchor.

To configure other OSD strings, click on **2**, **3** or **4** and set the appropriate text, alignment, and size.

Note: The ION-R100S provides a wide range of possible text sizes to ensure readability on a wide variety of display sizes.



The ION-R100S supports a list of custom OSD strings to display dynamic information (ex: the camera name or the current time). Click on [Custom String Formats](#) to see the complete list.

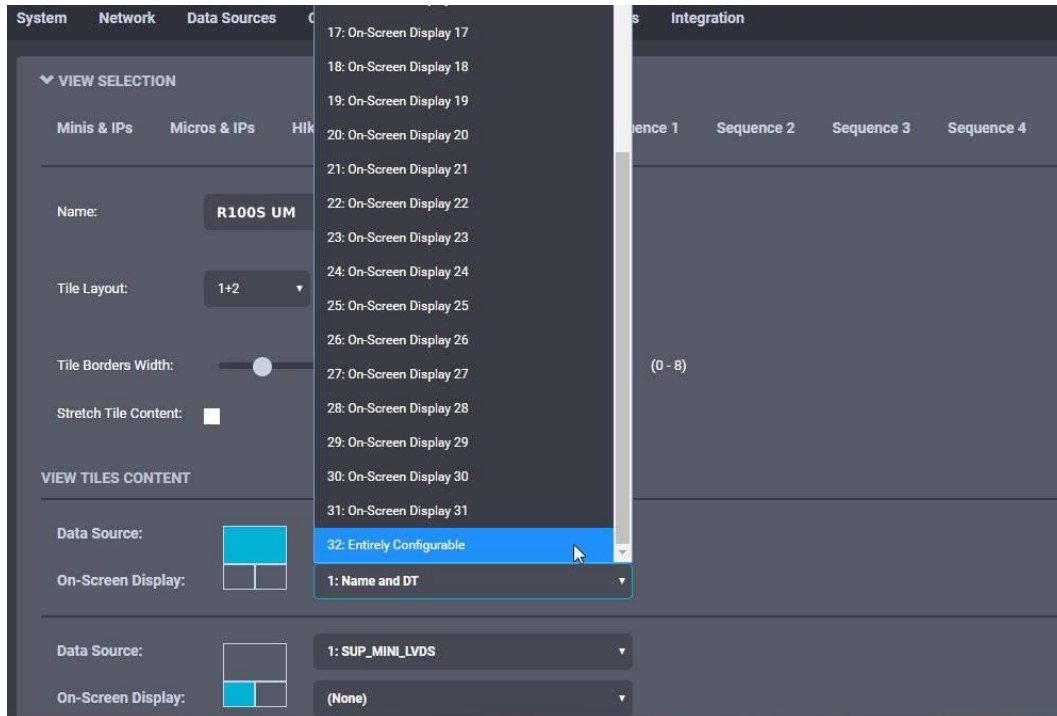


Note: Using custom OSD strings allows for greater flexibility. For example, “Indoor camera” in your OSD makes sense only for a camera installed indoors. Instead, using “%n” (data source name) allows creating one OSD and displaying it over all your video streams.

9.8.8 Displaying an On-Screen Display

In the **Configuration** page, select the **Views** tab. Scroll down to the **Tile Selection** section.

For the top left tile, click on the **On-Screen Display** field and select our newly configured OSD. Click on **Save** at the bottom to apply the change.



If you are configuring the ION-R100S from your computer through the device's web interface, the OSD is now displayed over the video. If you are configuring the ION-R100S locally, click on **Switch to Display View** at the top of the screen.



9.9 Configuring Web Connections

In the **Configuration** page, select the **Data Sources** tab. After that, select an unused data source to configure.

To configure a web connection, set **Data Source Type** to *Web Page*.

Type in the address of the web page in **Connection URI**. Type in a name (optional) for the data source, check **Enabled** to enable this data source and press **Save** at the bottom to save the new configuration.

System Network **Data Sources** On-Screen Displays Views Video Outputs Integration

▼ DATA SOURCE SELECTION

Select Data Source: 9: IONODES website ▼

☒ Enabled

Name: IONODES website

Data Source Type: Web Page ▼

Connection URI: http://www.ionodes.com/main/products/sds-landing-page/ion-r100s/

Test Connection

NOTE: Web pages can consume a lot of memory. Displaying multiple web pages simultaneously can impact the performance of the system.

Note: The ION-R100S connects to a web page **ONLY** when that web page is displayed. Enabling a data source indicates that the ION-R100S can establish this connection when needed, not that it needs to do so right away. Disabling a data source prevents the ION-R100S from connecting to the web page for any reason.


To display the web page, we need to add it to a view. In the **Configuration** page, select the **Views** tab. Scroll down to the **Tile Selection** section.

For the top right tile, click on the **Data Source** field and select our newly configured web page data source. Click on **Save** at the bottom to apply the change.

VIEW SELECTION

Minis & IPs Micros & IPs Hik multi test View 4 **R200 UM** Sequence 1 Sequence 2 Sequence 3 Sequence 4


Name: **R100S UM**


Tile Layout: **2x2** 


Tile Borders Width: **1** (0 - 8)


Stretch Tile Content: ☐


VIEW TILES CONTENT


Data Source:  **10: Kitchen entrance**

On-Screen Display:  **1: Name and DT**

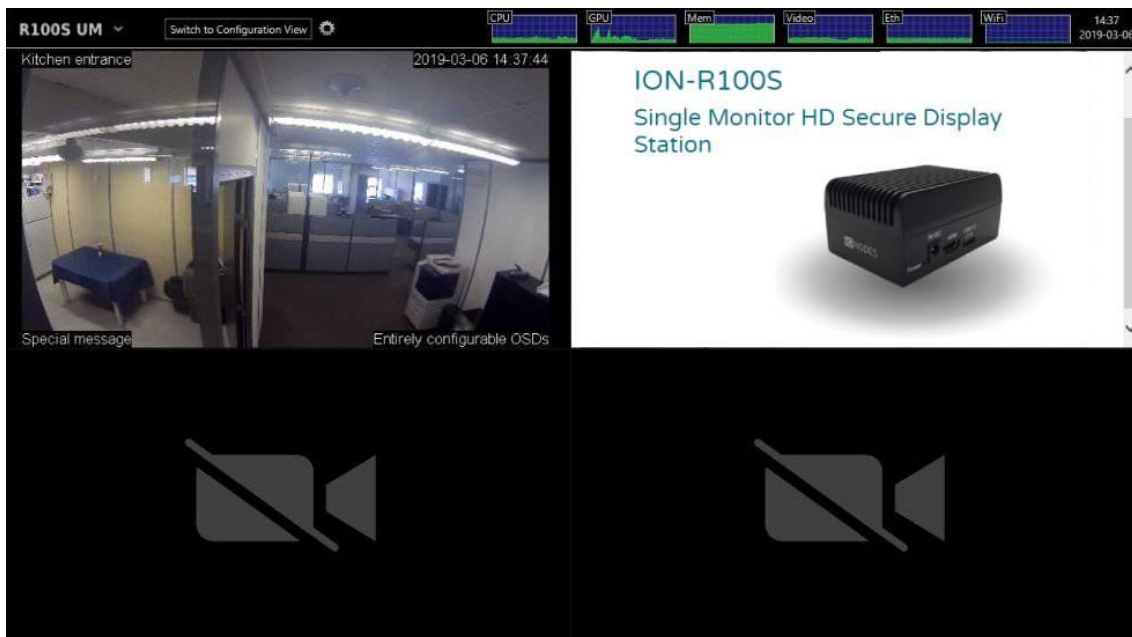
Data Source:  **9: IONODES website**

On-Screen Display:  **(None)**

Data Source:  **(None)**

On-Screen Display:  **(None)**

Save **Cancel**

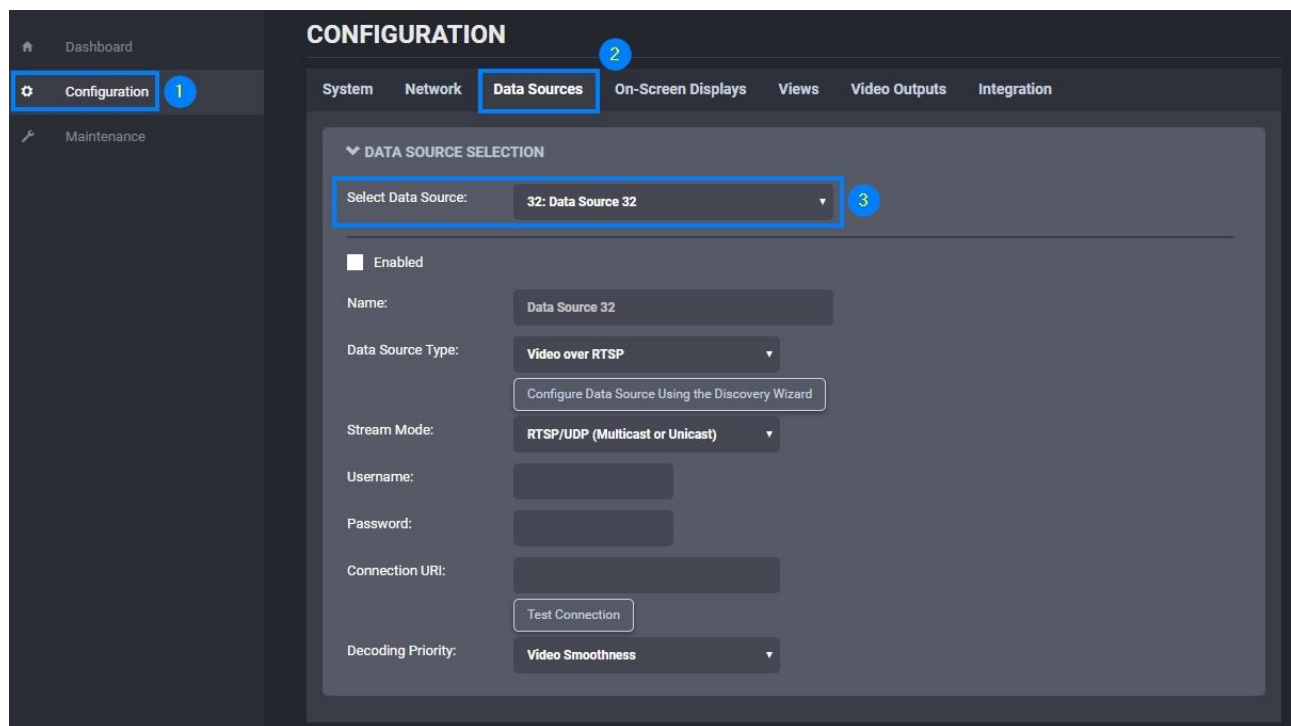


Warning: Modern web pages are often filled with highly dynamic media content. Displaying such content requires a lot of resources. Displaying multiple web pages WILL affect the video decoding performance of the ION-R100S.

9.10 Image Carousel

The IONODES Secure Display Station allow you to program a fully configurable image carousel as a data source that can be displayed on a video output tile of your choosing.

- 1- Select the **Configuration** page
- 2- Select the **Data Sources** tab
- 3- Select a data source to be configured in the **Data Source Selection** section



- 1- Select the **Data Source Type** as **Image Carousel**

CONFIGURATION

- System
- Network
- Data Sources**
- On-Screen Displays
- Views
- Video Outputs
- Integration

DATA SOURCE SELECTION

Select Data Source: **32: Data Source 32**

☐ Enabled

Name: **Data Source 32**

Data Source Type: **Video over RTSP**

Stream Mode:

Username:

Password:

Connection URI:

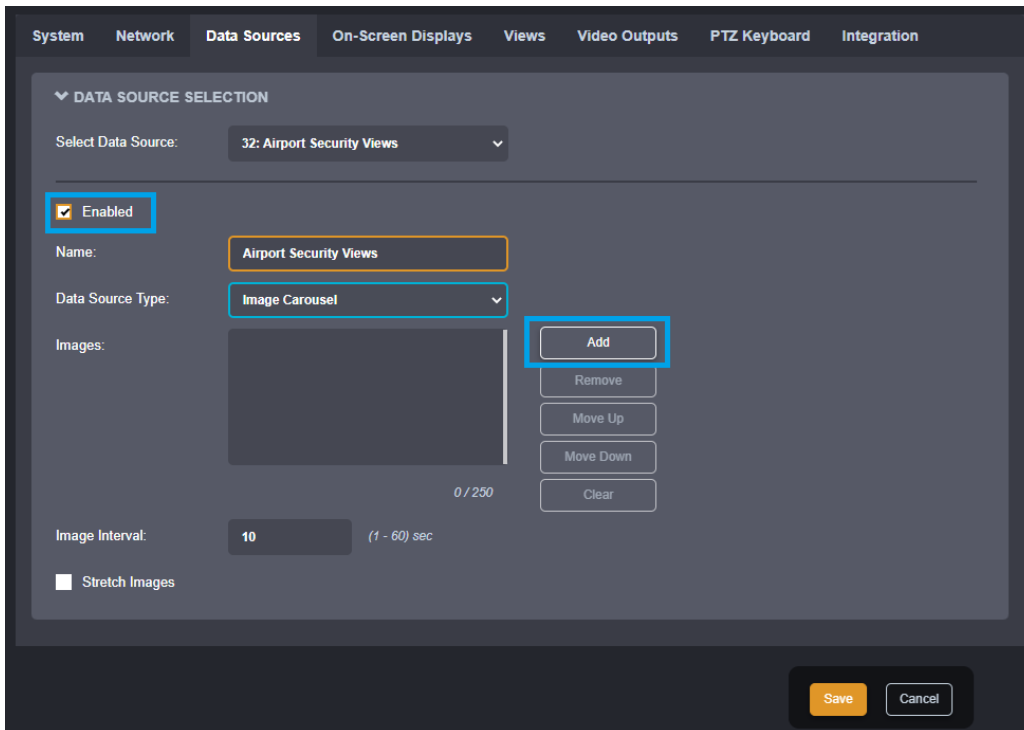
Test Connection

Decoding Priority: **Video Smoothness**

1

The image shows a configuration interface for a data source. A blue box highlights the 'Data Source Type' dropdown menu, which is currently set to 'Video over RTSP'. The dropdown list is open, showing options: 'Video over RTSP', 'Video over Passive RTP', 'Video over HTTP', 'Image Carousel', and 'Web Page'. A blue circle with the number '1' is next to the dropdown, indicating the step to select 'Image Carousel'.

- 1- Enable the data source
- 2- Modify the **Name** field to a custom name or description
- 3- Click **Add** to open the Media Library dialog



System Network **Data Sources** On-Screen Displays Views Video Outputs PTZ Keyboard Integration

DATA SOURCE SELECTION

Select Data Source: 32: Airport Security Views

☒ Enabled

Name: Airport Security Views

Data Source Type: Image Carousel

Images:

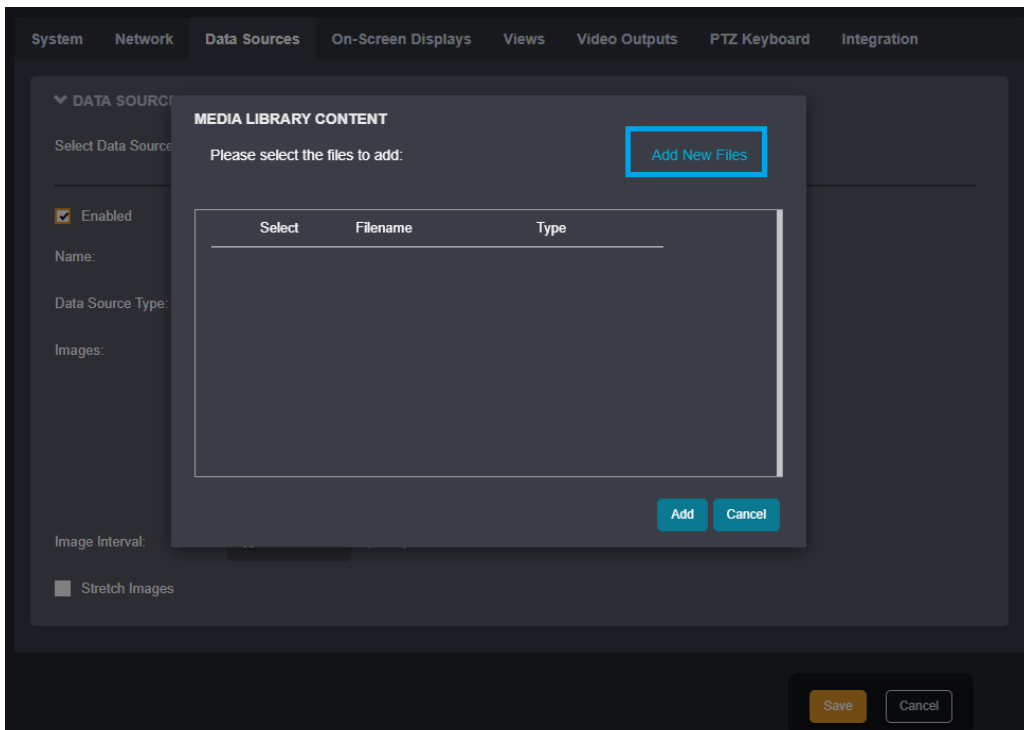
0 / 250

Image Interval: 10 (1 - 60) sec

☐ Stretch Images

Add Remove Move Up Move Down Clear

Save Cancel



System Network Data Sources **On-Screen Displays** Views Video Outputs PTZ Keyboard Integration

DATA SOURCE SELECTION

Select Data Source: 32: Airport Security Views

☒ Enabled

Name: Airport Security Views

Data Source Type: Image Carousel

Images:

0 / 250

Image Interval: 10 (1 - 60) sec

☐ Stretch Images

MEDIA LIBRARY CONTENT

Please select the files to add:

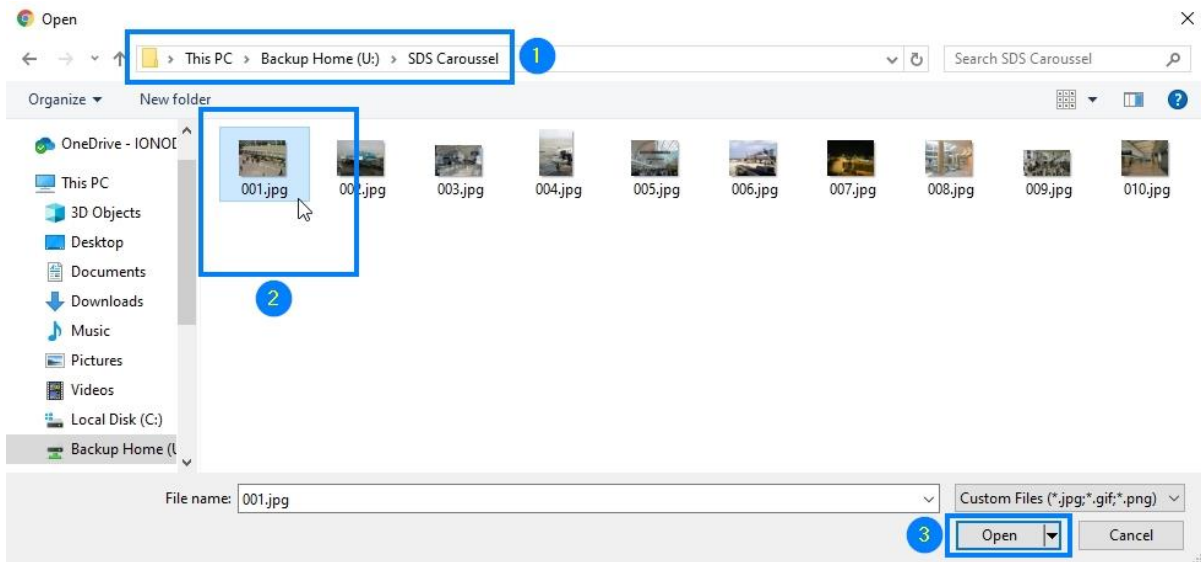
Add New Files

Select	Filename	Type

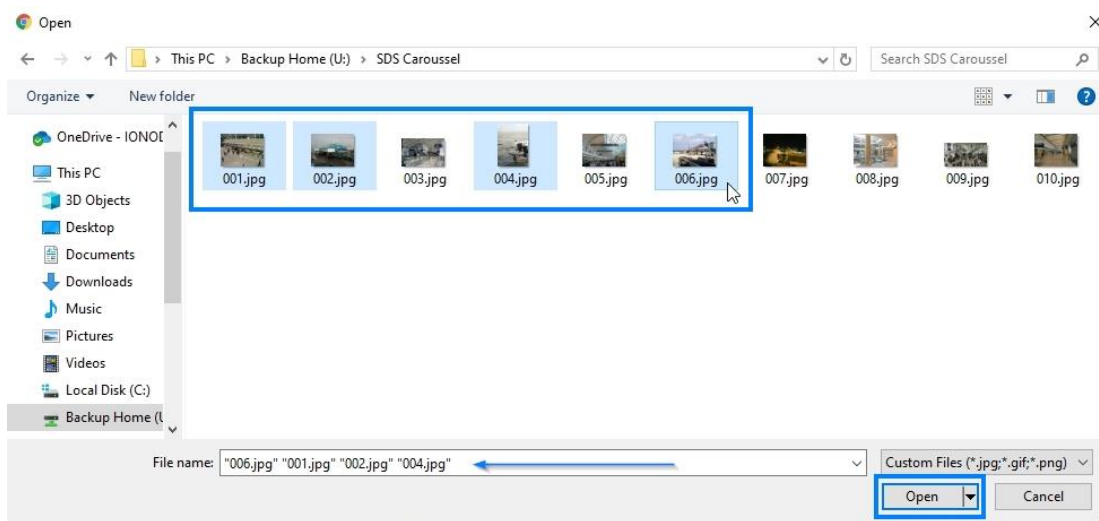
Add Cancel

Save Cancel

- 1- Click on **Add New Files** to open the File Explorer dialog
- 2- Navigate to the directory containing the image(s) to upload to the ION-R100S
- 3- Select an image
- 4- Click **Open** to automatically upload it to the ION-R100S Image Carousel

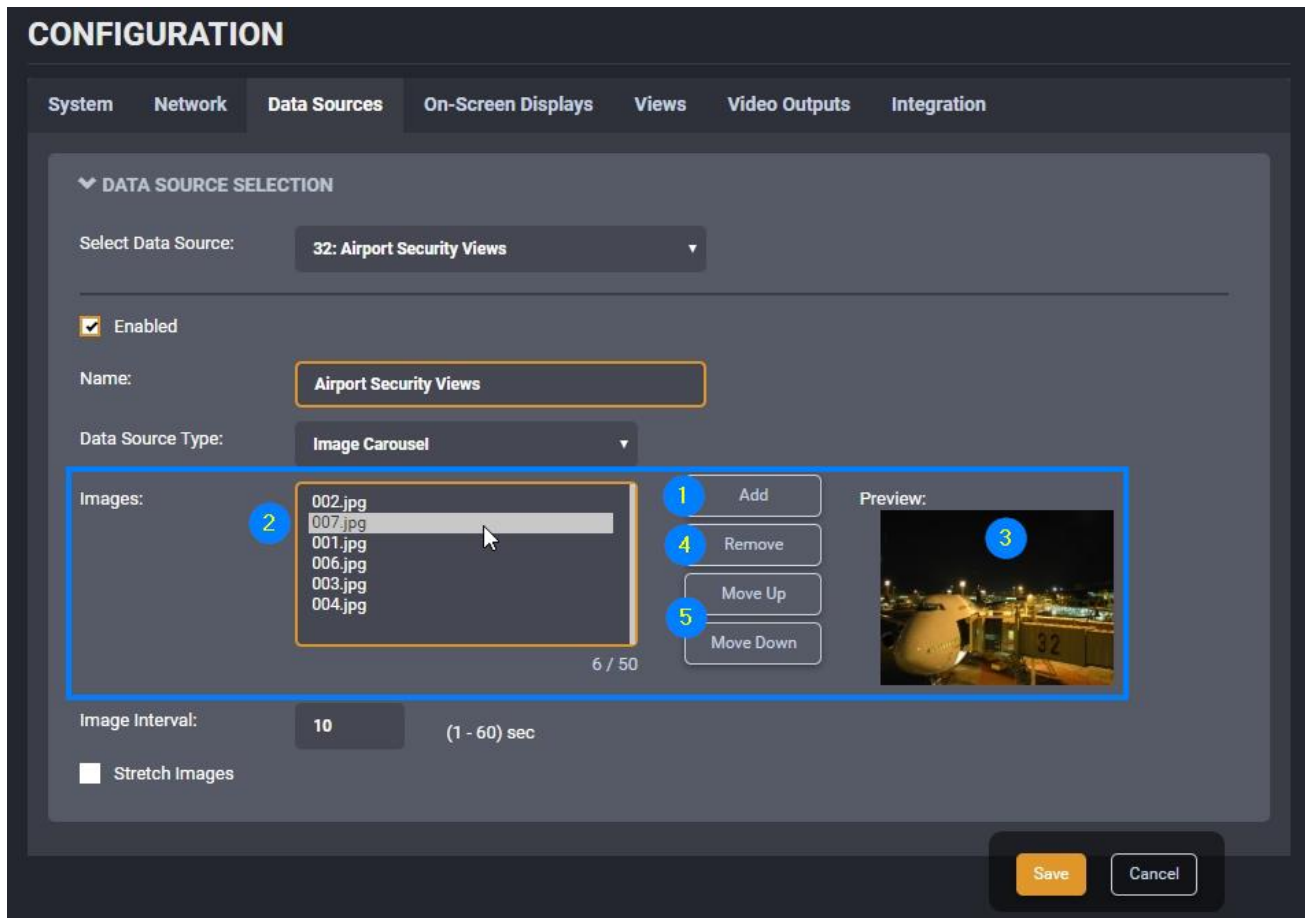


Note: Standard selection functions can be used in this step, such as holding the Ctrl key on the keyboard to select multiple images or selecting all images via the Ctrl-A keyboard shortcut, followed by the Open button to upload all selected images at once. If only a single image is to be uploaded, you may also double-click it to automatically upload it without clicking the Open button.



Several functions are available on the ION-R100S to manage the images once they have been uploaded.

- 1- You may upload additional images by clicking on the **Add** button once again
- 2- Selecting an image in the image list, you can:
- 3- **Preview** the image
- 4- **Remove** (delete) the selected image
- 5- Re-order the selected image in the image list by clicking the **Move Up** or **Move Down** buttons



Note: A maximum of 50 images may be uploaded to the ION-R100S per data source. Images must be in JPG, PNG or GIF (not animated in ION-R100S video output) formats with a maximum size of 2 MB (2048 kb). GIF and PNG transparency is supported.

Note: All uploaded images can be managed through the Media Library.

- 1- Set the image interval for the images to be displayed
- 2- Select stretch if you want the images to be stretched full screen within the chosen video tile. Ensure to have proper image aspect ratio based on your screen resolution & tile size when activating this function.

The screenshot displays the 'CONFIGURATION' window with the 'Data Sources' tab selected. Under 'DATA SOURCE SELECTION', the 'Select Data Source' dropdown is set to '32: Airport Security Views'. The 'Enabled' checkbox is checked. The 'Name' field contains 'Airport Security Views'. The 'Data Source Type' is set to 'Image Carousel'. The 'Images' list shows a sequence of files from '002.jpg' to '004.jpg', with '007.jpg' highlighted. To the right of the list are buttons for 'Add', 'Remove', 'Move Up', and 'Move Down'. A 'Preview' window shows a night-time airport scene. At the bottom, the 'Image Interval' is set to '5' seconds (with a range of '1 - 60' seconds indicated), and the 'Stretch Images' checkbox is checked. A 'Save' button and a 'Cancel' button are at the bottom right. Red callout boxes with numbers 1 and 2 highlight the 'Image Interval' and 'Stretch Images' settings respectively.

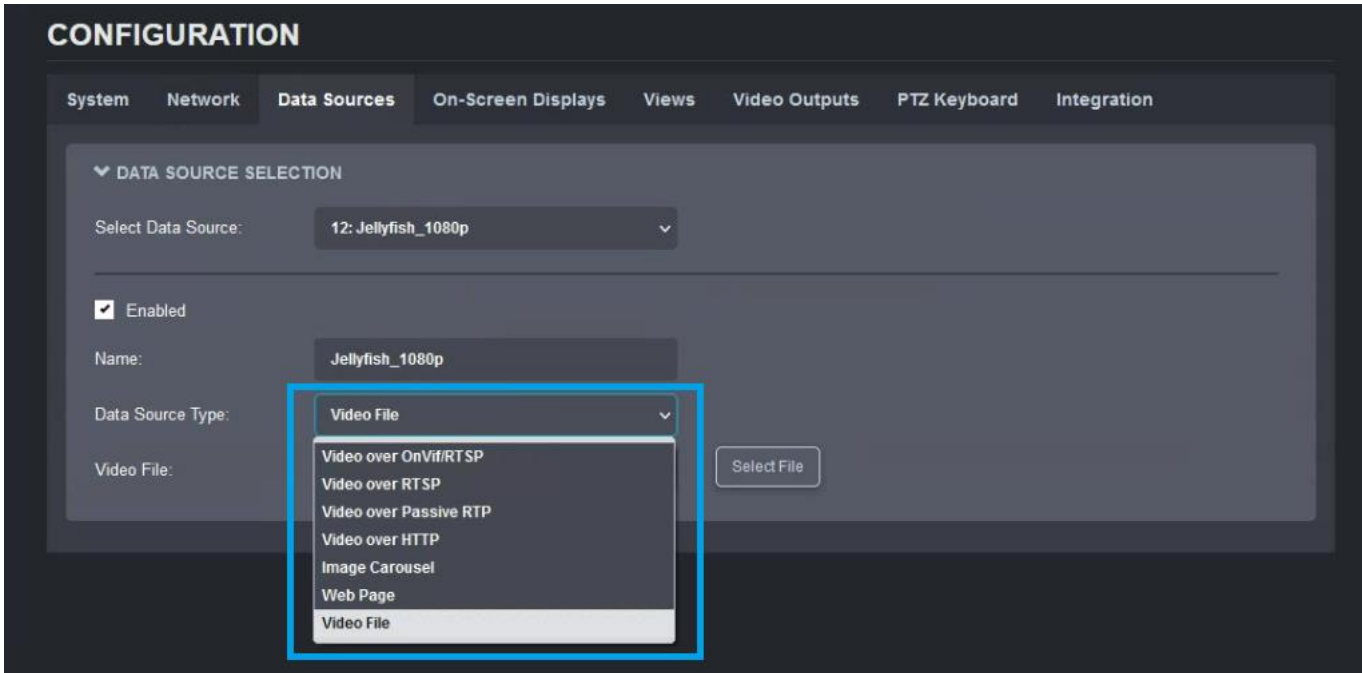
Note: When Stretch Images is checked, images will be stretched to fill the entire view tile, regardless of the images' aspect ratio. When unchecked, images will take as much space as possible in the view tile while preserving the images' aspect ratio.

9.11 Video file playback

Secure Display Stations allow the user to playback within a tile a selected video file stored on the internal memory of the device.

To access this function please follow these steps:

- 1- Select the Configuration page
- 2- Select the Data Sources tab
- 3- Select a data source to be configured in the Data Source Selection section
- 4- Set the Data Source Type to Video File



CONFIGURATION

System Network **Data Sources** On-Screen Displays Views Video Outputs PTZ Keyboard Integration

▼ DATA SOURCE SELECTION

Select Data Source: 12: Jellyfish_1080p ▼

☒ Enabled

Name: Jellyfish_1080p

Data Source Type: Video File ▼

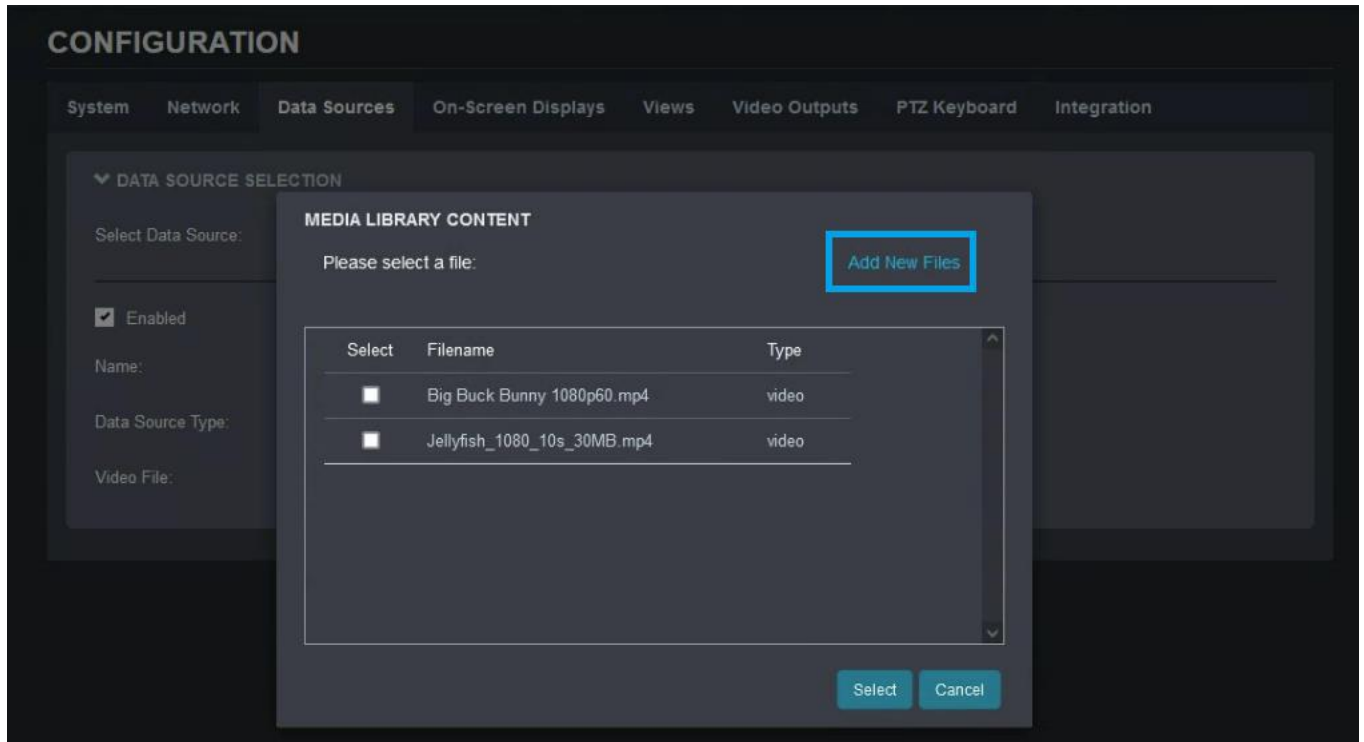
Video File:

Select File

Video File
Video over OnVif/RTSP
Video over RTSP
Video over Passive RTP
Video over HTTP
Image Carousel
Web Page
Video File

When selecting the video file, the user is presented with 2 options:

- 1- Select a file which is already uploaded to the media library of the Secure Display Station. For more information on how to add files via the Media Library feature, please see the dedicated section in this user manual.
- 2- Add new files – The user can directly upload new files to the Secure Display Station and use one of them for this specific data source



Note: Only *.mp4 files are supported for playback, and they need to be encoded using H.264 or H.265 codecs. Other video containers or codecs are not supported right now.

Note: Please also note the limitations related to the Media Library: maximum number of files 250 and total size of 1024 MB (all uploaded media files combined).

9.12 Configuring Views

In the **Configuration** page, select the **Views** tab.


Views have the following configuration:


- **Name**
User friendly name. Also displayed in the view selector in the top-left corner of the screen.
- **Tile Layout**
Views display content in one or more tiles. The tile layout dictates how many tiles to display as well as how to organize these tiles.
- **Tile Border Width**
Determines the width of the borders around each tile. A value of 0 means that no border will be shown.
- **Stretch Tile Content**
When the aspect ratio of a video stream does not match the aspect ratio of the tile displaying it, this setting determines whether the video is stretched to fill the entire tile or scaled to fit inside.

VIEW SELECTION

Minis & IPs Micros & IPs Hik multi test View 4 **R100S UM** Sequence 1 Sequence 2 Sequence 3 Sequence 4


Name: **R100S UM**

Tile Layout: **2x2** 

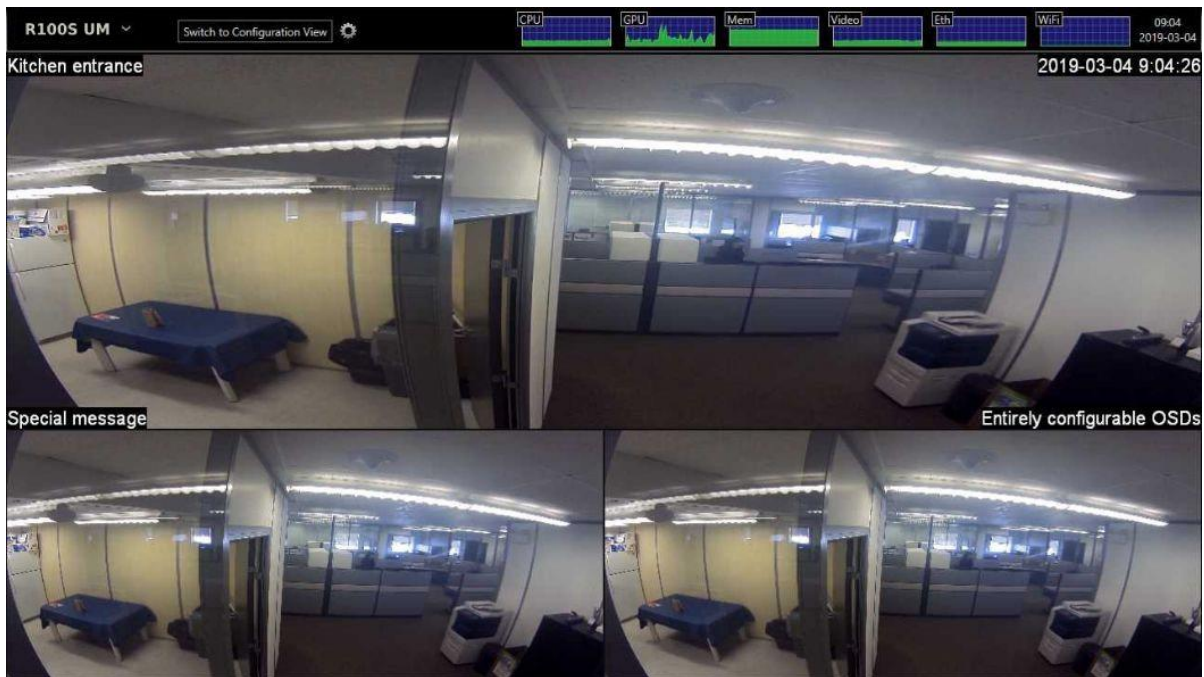
Tile Borders Width: **2x2**  **1** (0 - 8)

Stretch Tile Content:

VIEW TILES CONTENT

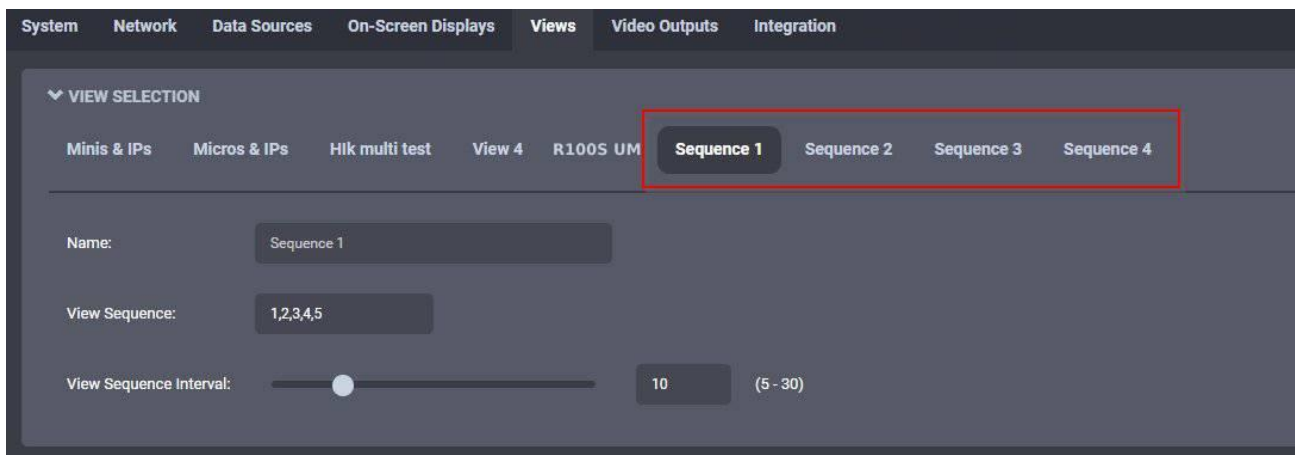
Data Source:	1x2	10: Kitchen entrance
On-Screen Display:	2x3	1: Name and DT
	2x1	
Data Source:	3x2	9: IONODES website
On-Screen Display:	1+2	(None)
	1+3	
	2+3	
Data Source:	3+4	(None)
On-Screen Display:	1+5	(None)
	5+1	
	2+5	
Data Source:	5+2	(None)
On-Screen Display:		(None)

Note: Stretching the content of a video tile can visibly deform the video, as shown in the images below. Web pages simply adjust their layout based on the available space, so they are generally not affected in the same way.

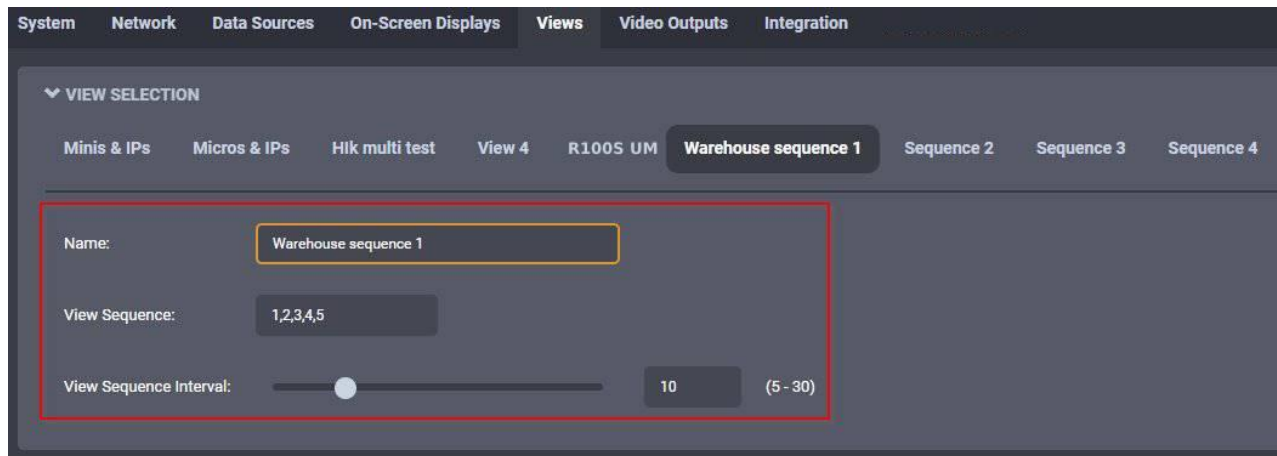


9.13 View Sequences

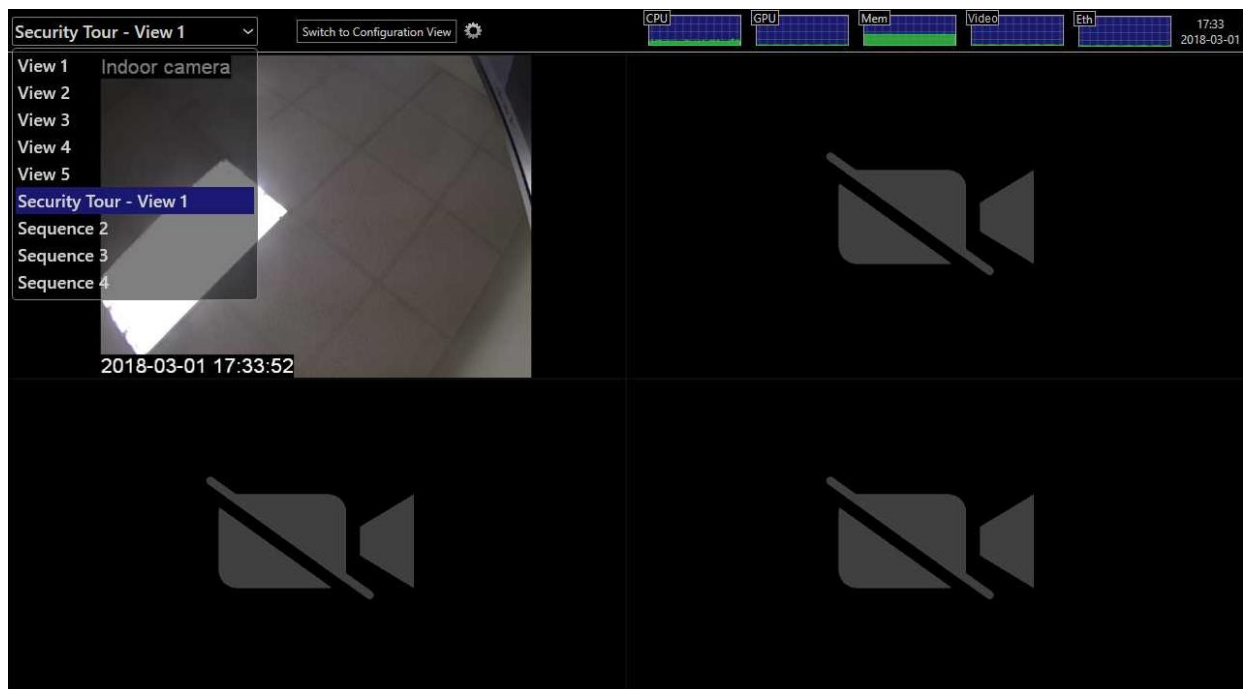
Once you have configured two or more views to display your various video streams, you can configure the ION-R100S to cycle through each of your views automatically on a timer. The timer as well as the order of views in the sequence is user configurable.



To configure a view sequence, simply enter the list of views you want to display, in the desired order and separated by commas, and the duration each view will be displayed. Select a name for the view sequence (optional) and click on **Save** to save the configuration.

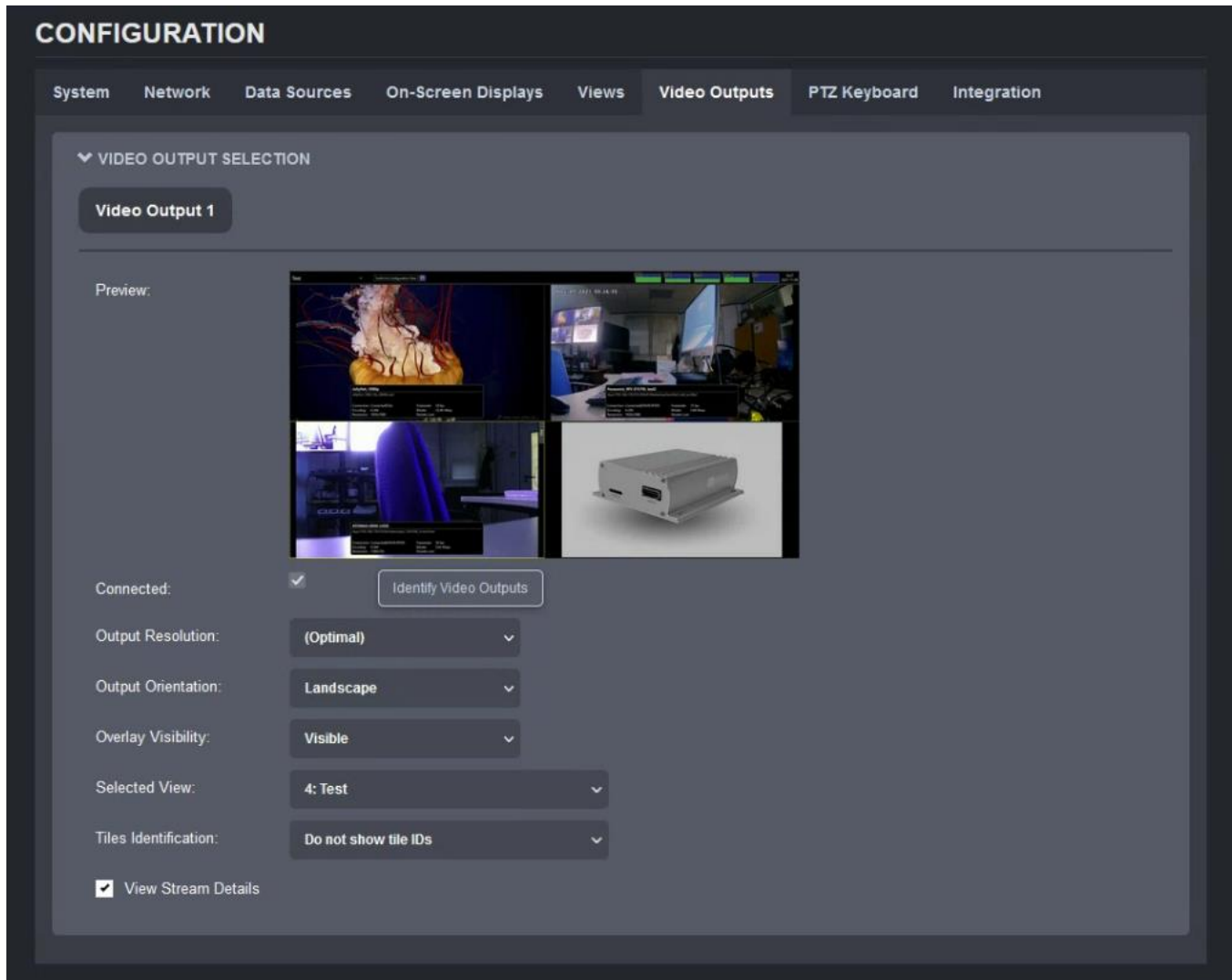


Back in Display Mode, you can now select the view sequence start the sequence. When a view sequence is selected, the name of the view currently displayed will also be shown.



9.14 Configuring Video Output

In the **Configuration** page, select the **Video Outputs** tab.



The configuration of the display output is as follows:

- **Connected** (read only)
Indicates whether the display output is connected to a physical display.
- **Output Resolution**
Determines the display resolution to use for this output. See below for details.

- **Output Orientation**

Determines the orientation of this output. The available options are: Landscape, Portrait, Landscape (Flipped) and Portrait (Flipped).

- **Overlay Visibility**

The overlay is the utility bar at the top of the screen. The overlay can be displayed at all times or it can automatically hide itself after being used. When auto-hidden, moving the mouse to the top of the screen shows (temporarily) the overlay.

- **Selected View**

Selects the view to display on this output. Changing this value is the equivalent of selecting a view in the view selector in the top-left corner of the screen.

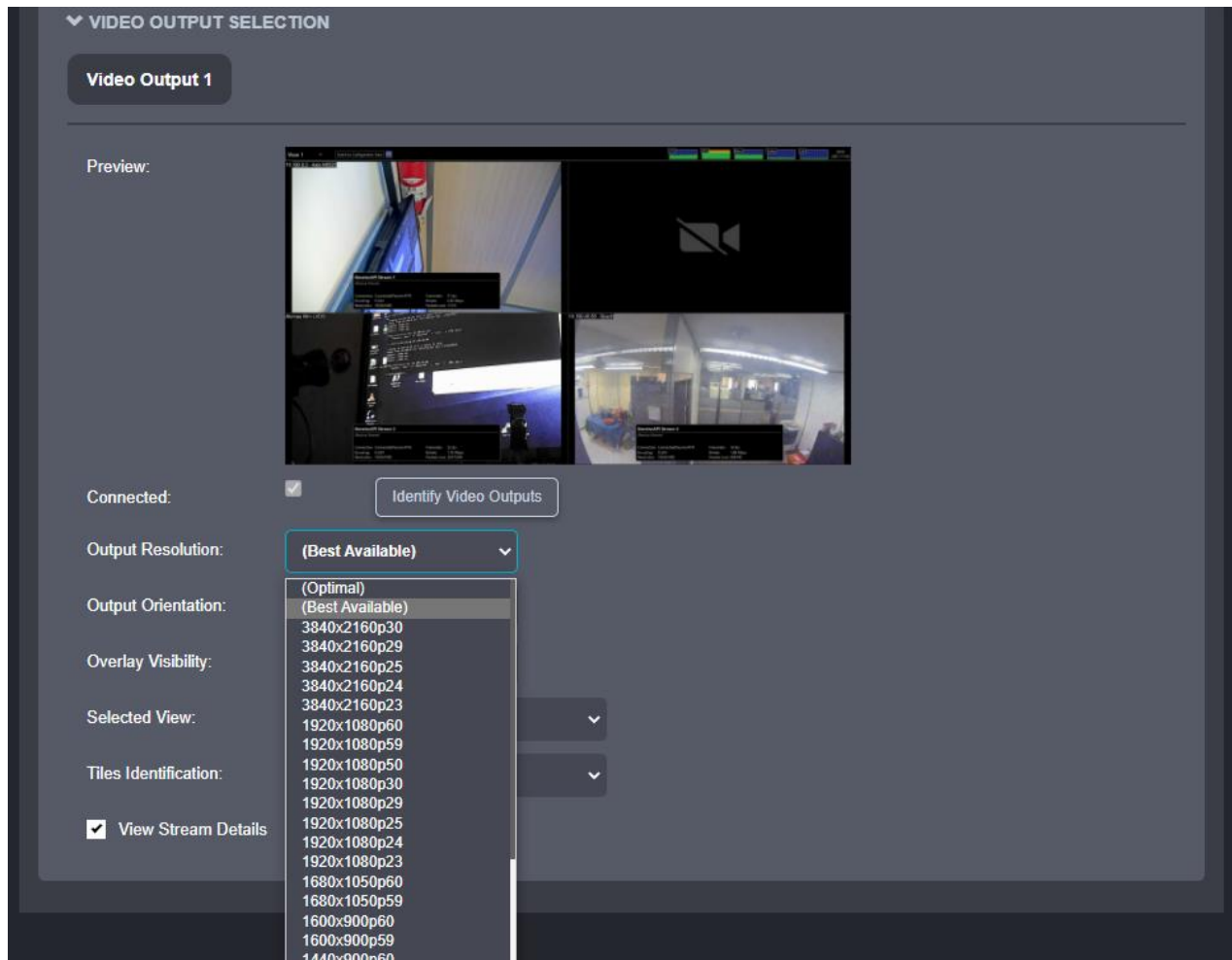
- **Tiles Identification**

Adds a small on-screen text for each tile depicting the ID of that tile. This is particularly useful for quickly identifying a tile when using multiple video outputs and multiple tiles in each video output. The IDs can be either global (ex. Tile 17 could be for instance the 1st tile from the 2nd video output if the 1st output was using a 4x4 layout with 16 tiles) or per each output (ex. Tile 2 -1 means the 2nd video output, tile number 1).

- **View Stream Details**

Diagnostic function detailed in section 14.1.

By default, display outputs are configured to automatically select the best resolution supported by the TV or monitor. In most cases, this is the desired behavior. If you want to use a different resolution, click on **Output Resolution** to display the list of supported resolutions.



If you disconnect a display, the ION-R100S remembers the selected output resolution in case the display was disconnected by mistake. If you reconnect the same display, the output resolution remains unchanged. If you connect a different display in its place, the new display may not support the same set of possible output resolutions. In that case, the output resolution automatically reverts to *Best Available* to prevent any compatibility issues with the new connected display.

9.15 PTZ Control

The ION-R100S allows you to send PTZ and presets commands directly from any video tile window showing video from a PTZ-enabled data source. You just need to connect any standard keyboard and mouse to your ION-R100S. Once done, you simply need to select the video tile to display the PTZ control.

Note: Your data source must have **Enabled PTZ** checked. If this setting doesn't appear, it means your data source does not support PTZ over ONVIF or was configured with PTZ disabled. Only the ONVIF Continuous Mode is supported.

The following control should be depicted within your video tile:



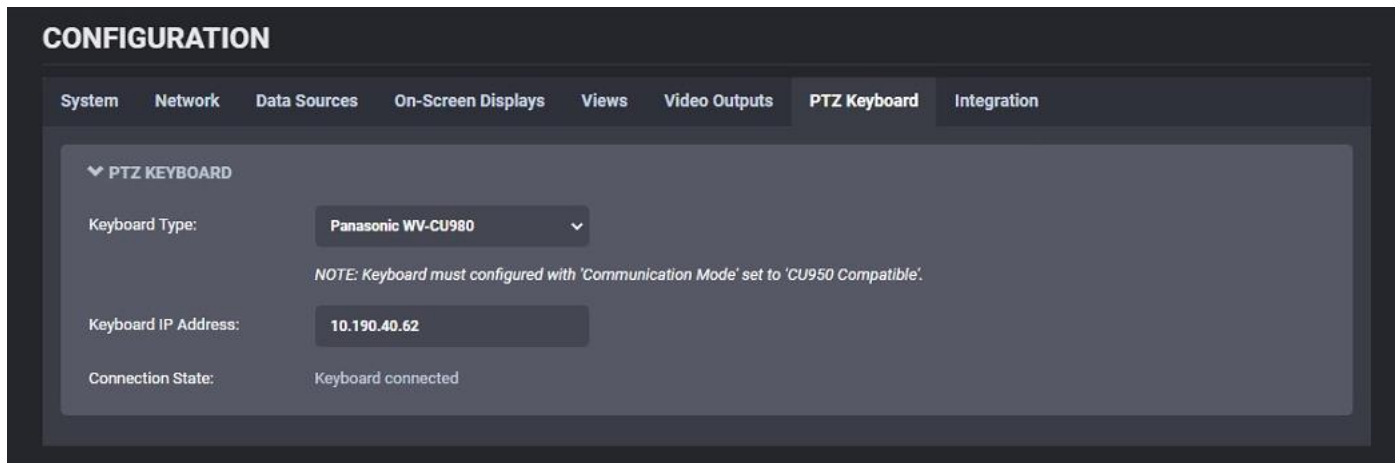
- 1: **Pin Icon:** Click to pin/unpin the PTZ control
- 2: **Pan/Tilt:** Controls Pan/Tilt movement. Further you move away from the middle, faster Pan/Tilt movement will be.
- 3: **Zoom:** Controls Zoom In/Out. Further you move away from the middle, faster zooming will be.
- 4: **Select Preset:** Select a preset from the list of presets stored in the data source.
- 5: **GoTo:** Go to the currently selected preset.
- 6: **Set:** Set the current PTZ position for the selected preset
- 7: **Create:** Create a new preset in the data source
- 8: **Remove:** Removes the currently selected preset from the data source
- 9: **Refresh Presets:** Updates the list of presets from the data source

9.16 PTZ Keyboard

The ION-R100S can be operated remotely, over the LAN, via a network keyboard (an optional joystick may or may not be attached to the keyboard).

To get started you need to select the keyboard type and input the IP address of the keyboard. If everything is configured correctly, it only takes a couple of seconds to connect to the keyboard. The web interface of the ION-R100S offers the end-user feedback with regards to the current connection state. The connection state is also reported on the keyboard's built-in status screen.

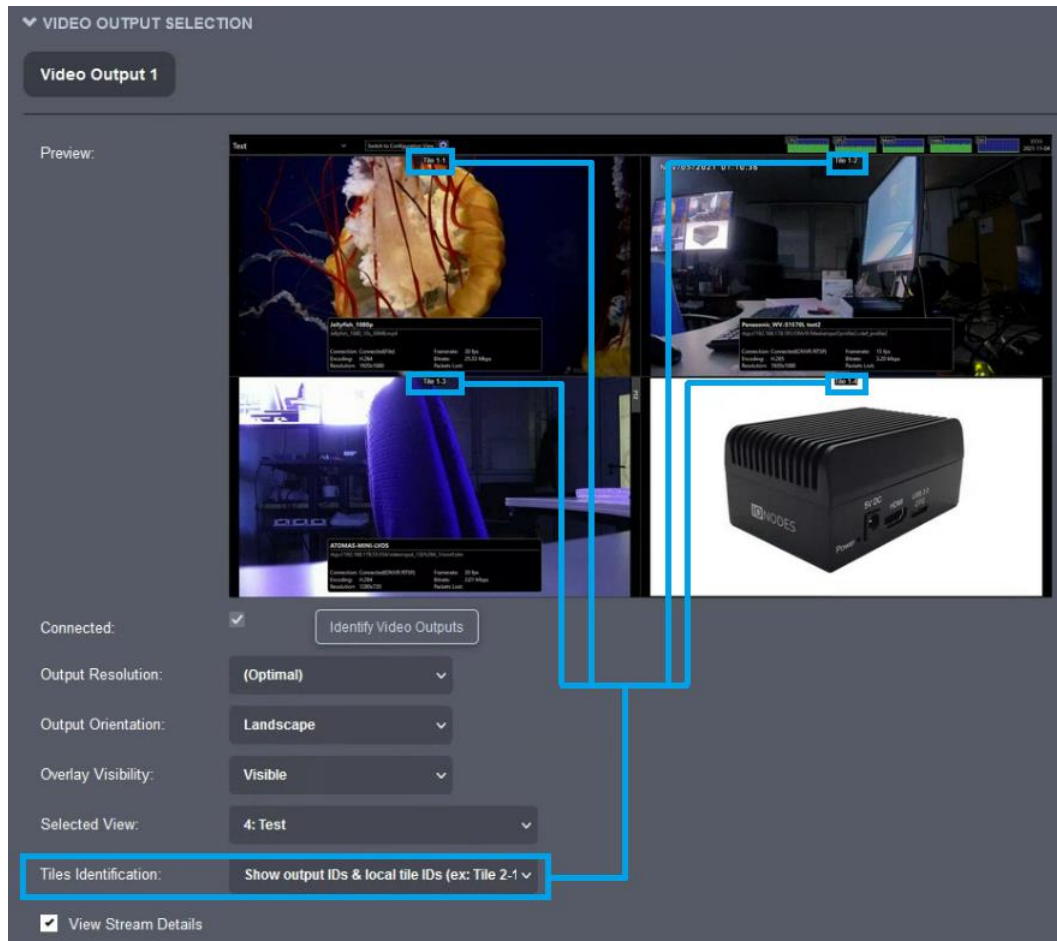
Note: Please check your keyboard's user manual for more information on how to configure its own IP address and how to set the IP address of the remote device that the keyboard is connecting to. Be aware that using DHCP on the remote device (in our case the ION-R100S) can cause connection issues with the keyboard if the IP address changes after a reboot or after unplugging/plugging the Ethernet cable.



The network keyboard allows you to select a specific tile on the screen and assign a data source to it from the list of available data sources. When an invalid tile or data source is selected, a visual feedback is offered on the keyboard's built-in status screen. The command sequence is as follows:

- to select the tile, input on the PTZ keyboard the tile number + the key "MON"; note that the tile stays selected until a different tile is selected or the keyboard is disconnected
- to assign a camera to a previously selected tile, input on the PTZ keyboard the corresponding data source number + "CAM"

If the keyboard also has the joystick attached, the end-user will be able to operate pan/ tilt/ zoom functions for supported cameras (cameras that expose PTZ via ONVIF). The movement speed & direction will be based on the keyboard's internal settings.



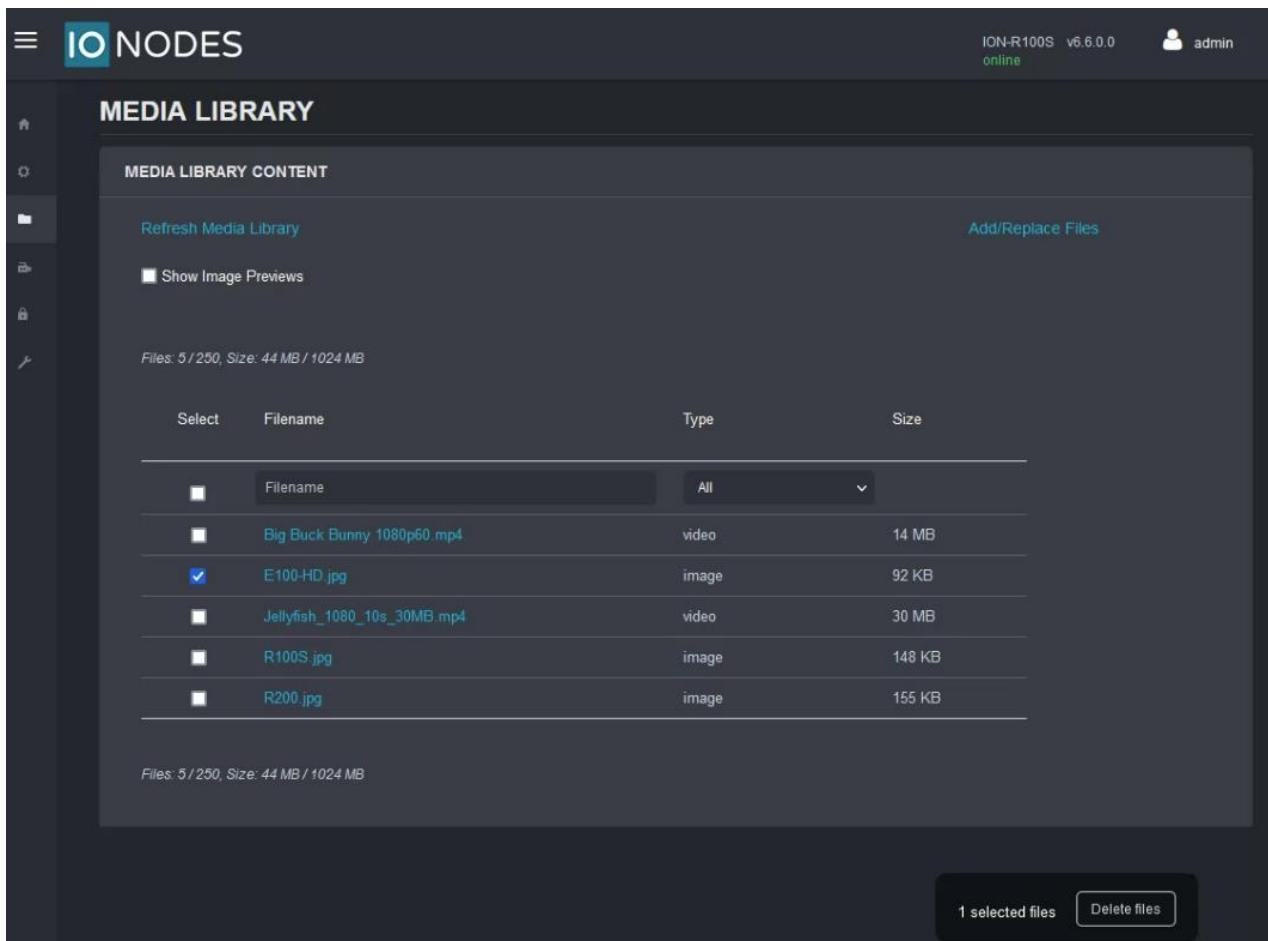
In order to help the operator correctly identify the tile on the monitor, a new **Tiles Identification** feature has been added to the **Video Outputs** section. The IDs can be either global (ex. Tile 17 could be for instance the 1st tile from the 2nd video output if the 1st output is using a 4x4 layout with 16 tiles) or per each output (ex. Tile 2 -1 means the 2nd video output, tile number 1).

10 Media Library

This section allows the user to manage the local library of media (image/video) files that can be displayed in tiles on the Secure Display Station.

The actions that can be performed are the following:

- 1) **Add/Replace Files** – use this button to upload new files (or replace existing files) from your local machine onto the Secure Display Station via the network
- 2) **Delete files** – select the files that you wish to delete and then click on the **Delete** button that appears on the bottom of the page to remove those files from the Media Library
- 3) **Show Image previews** – this is only possible for static images (not available for videos)

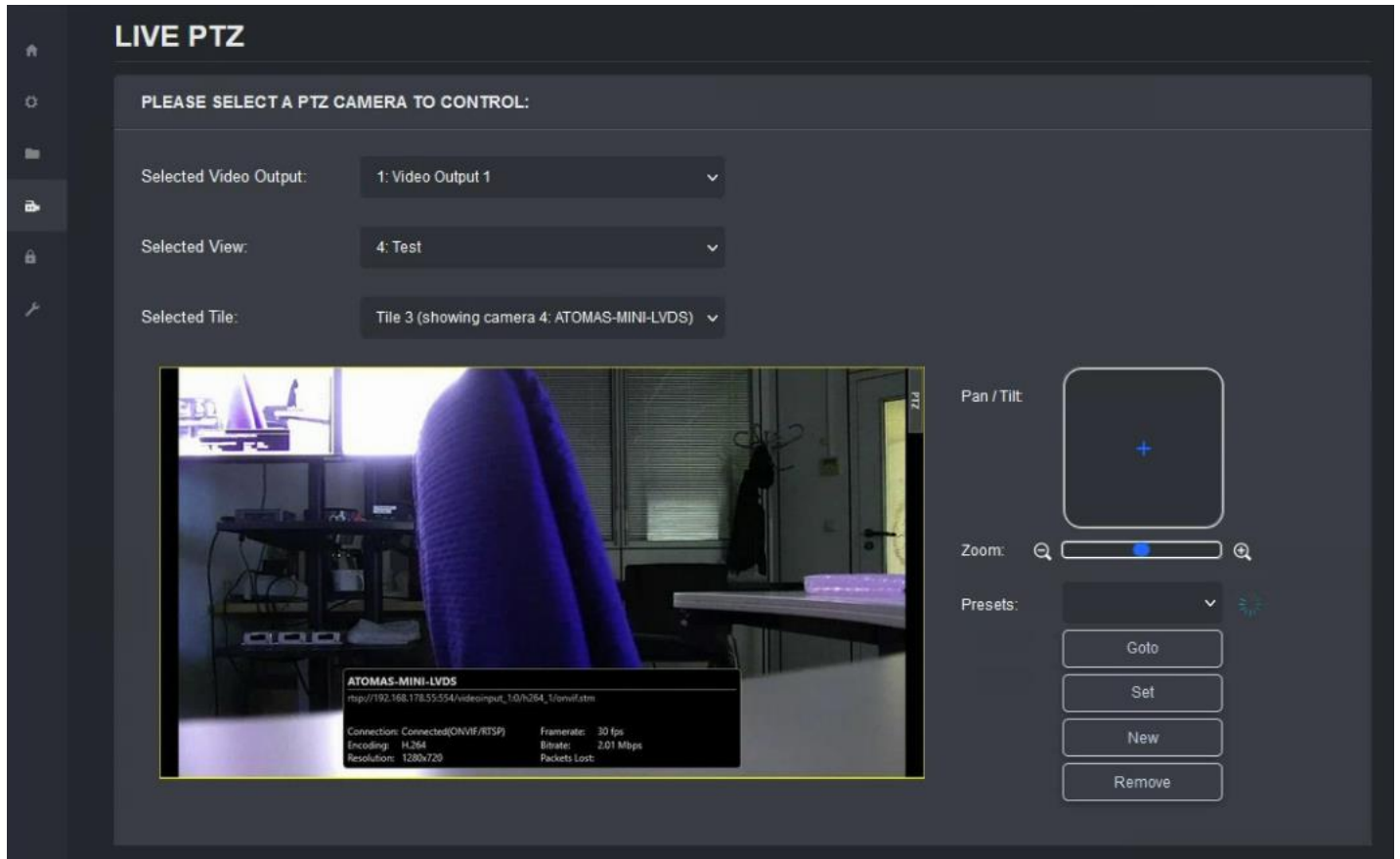


The screenshot shows the IONODES Media Library interface. At the top, there's a header with the IONODES logo, version information (ION-R100S v6.6.0.0), and a user profile (admin). The main section is titled "MEDIA LIBRARY" and contains a "MEDIA LIBRARY CONTENT" area. This area has a "Refresh Media Library" button and a "Show Image Previews" checkbox. Below this, it shows "Files: 5 / 250, Size: 44 MB / 1024 MB". A table lists the files with columns for "Select", "Filename", "Type", and "Size". The table contains five rows of files, with the second row "E100-HD.jpg" selected. At the bottom right, there's a button labeled "Delete files" and a status indicator "1 selected files".

Select	Filename	Type	Size
<input type="checkbox"/>	Filename	All	
<input type="checkbox"/>	Big Buck Bunny 1080p60.mp4	video	14 MB
<input checked="" type="checkbox"/>	E100-HD.jpg	image	92 KB
<input type="checkbox"/>	Jellyfish_1080_10s_30MB.mp4	video	30 MB
<input type="checkbox"/>	R100S.jpg	image	148 KB
<input type="checkbox"/>	R200.jpg	image	155 KB

11 Live PTZ

This section allows the user to choose a PTZ-enabled camera from a specific tile inside a View and control from this web page the Pan/Tilt/Zoom movement of that camera. The user can also call existing PTZ Presets stored on the camera or create new ones.

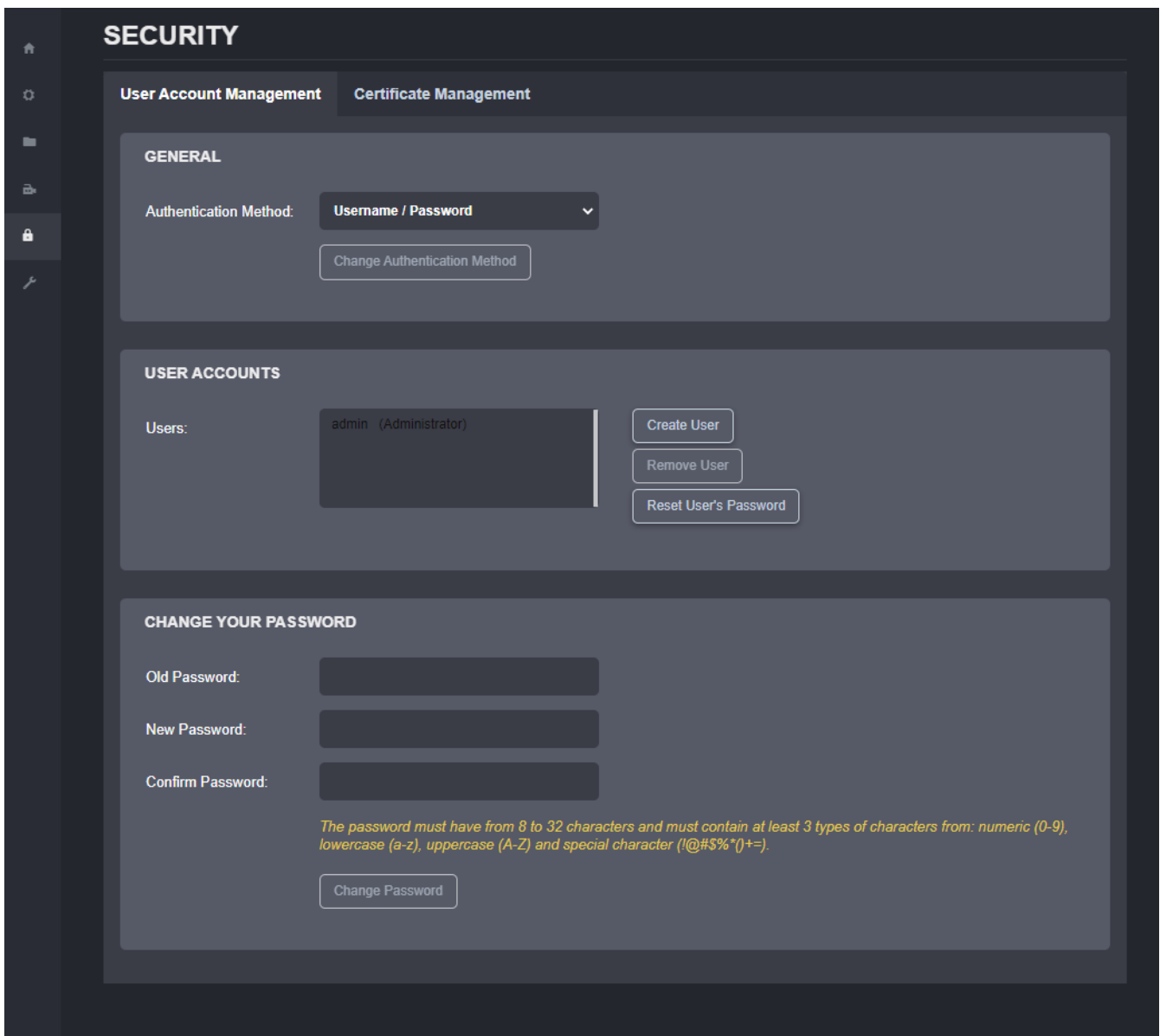


Note: The Live PTZ feature is useful for cases where the user can't connect an USB mouse & keyboard to the Secure Display Station to control the PTZ from the Display View section. Here the control is done remotely, directly from the machine running the Secure Display Station's web interface.

12 Security

12.1 User Account Management

This section allows the administrator to manage user accounts on the device (create account/ remove account/ reset user's password). If the current logged in user has any other role aside from Administrator, this section will only show the option to change its own password (only administrators can manage other user accounts).



The screenshot displays the 'SECURITY' section of the IONODES interface, specifically the 'User Account Management' tab. The interface is dark-themed with a sidebar on the left containing navigation icons. The main content area is divided into three sections:

- GENERAL:** Contains an 'Authentication Method' dropdown menu set to 'Username / Password' and a 'Change Authentication Method' button.
- USER ACCOUNTS:** Displays a list of users, currently showing 'admin (Administrator)'. To the right of the list are three buttons: 'Create User', 'Remove User', and 'Reset User's Password'.
- CHANGE YOUR PASSWORD:** Contains three password input fields labeled 'Old Password:', 'New Password:', and 'Confirm Password:'. Below these fields is a 'Change Password' button and a note: 'The password must have from 8 to 32 characters and must contain at least 3 types of characters from: numeric (0-9), lowercase (a-z), uppercase (A-Z) and special character (!@#%*()+=)'. The note is highlighted in yellow.

NEW USER

Username:

Password:

Confirm:

The password must have from 8 to 32 characters and must contain at least 3 types of characters from: numeric (0-9), lowercase (a-z), uppercase (A-Z) and special character (!@#\$%^&()+=).*

Role:

Each new user account must have a role assigned to it. There are 4 types of user role available to choose from: Administrator, Superuser, Poweruser and User. The table below summarizes permissions for each role.

Role	Description
User	<ul style="list-style-type: none"> can access System Dashboard (Product Info/System Status/Resources usage) can access Media Library can change his own password
Poweruser	*in addition to the User role: <ul style="list-style-type: none"> can change all configuration settings can access the Live PTZ section can access the Maintenance section, but cannot perform a firmware update or reset the device to factory default settings
Superuser	*in addition to the Poweruser role: <ul style="list-style-type: none"> can access all functionality from the Maintenance section
Administrator	*in addition to the Superuser role: <ul style="list-style-type: none"> can create or modify all user accounts

The built-in administrator account cannot be deleted. Upon first access to the web interface the user will be asked to change the password for the administrator account. The new password for the administrator account, will be required to have a minimum length of 8 characters and use at least 3 different character types based on the following: upper case letters, lower case letters, numbers, and symbols/special characters, such as ~ ` ! @ \$ ^ *) _ - + { [] | : ; ' ? , . / .

Note: There is no way to recover the password of the built-in administrator account if lost. In this case you'll need to reset the device to factory default settings by following the procedure explained in chapter 14.2 of this document.

12.2 Certificate Management

This section allows the administrator to manage custom SSL/TLS certificates.

The screenshot displays the 'SECURITY' section of the IONODES web interface, specifically the 'Certificate Management' tab. The interface is dark-themed. On the left, there is a sidebar with navigation icons. The main content area is divided into two sections. The top section, titled 'CERTIFICATES', contains a table with columns: 'Select', 'Friendly Name', 'Expiration Date', 'Thumbprint', and 'Role'. Below the table, it indicates 'Certificates: 0 / 5'. At the bottom of this section are three buttons: 'Add New Certificate', 'Remove Selected Certificate', and 'Use Selected Certificate'. The bottom section, titled 'CERTIFICATE SIGNING REQUEST', contains several input fields: 'Common Name (CN):' (with a '(Required)' label), 'Organization Name (O):', 'Organization Unit (OU):', 'Country (C):' (a dropdown menu), 'State or Province Name (ST):', and 'Locality Name (L):'. At the bottom of this section is a 'Generate Certificate Signing Request' button and a warning message: 'Warning: Only the latest certificate signing request (CSR) can be downloaded.'

The web interface and HTTP-based APIs (ION API) of the SDS can be accessed using HTTP or HTTPS. In HTTPS, the communication protocol is encrypted using Transport Layer Security (TLS) or Secure Sockets Layer (SSL). The SDS supports TLS 1.2 (support for the older TLS 1.0 and TLS 1.1 has been disabled since firmware v6.7.0.0) and uses a self-signed certificate generated during manufacturing, making it unique for each device. You can replace the default certificate by providing your own custom SSL/TLS certificate.

Note: The only formats accepted for the SSL/TLS certificate file are *.pfx or *.p12.

A Certificate Signing Request (CSR) is a block of encoded text forwarded to a Certificate Authority (CA) when users apply for a custom SSL/TLS certificate. CSR is created on the server where the certificate will be installed, in our case on the SDS. CSR includes information such as domain name, organization name, locality, and country. The request also contains the public key, which will be associated with the certificate generated, and the same server also generates the private key. When developing the certificate, the CA only uses the public key. The private key should be saved and kept secret, as the private key is the key pair of the public key, and the certificate would not work if we lost the private key.

A CSR contains:

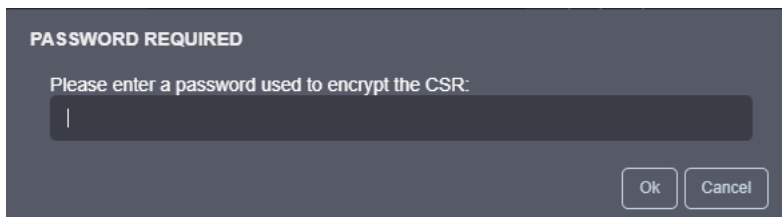
- Common Name (CN): Fully qualified domain name of the server, such as ionodes.com
- Organization Name (O): Legal name of the organization such as 'IONODES Inc.'
- Organization Unit (OU): Division of the organization, such as IT Department, or Marketing
- Country (C): such as Canada
- State or Province Name (ST): such as Quebec
- Locality Name: such as Montreal

The screenshot shows a web form titled "CERTIFICATE SIGNING REQUEST". It contains several input fields for generating a CSR:

- Common Name (CN):** A text input field containing "ionodes.com" with a "(Required)" label to its right.
- Organization Name (O):** A text input field containing "IONODES Inc."
- Organization Unit (OU):** A text input field containing "IT Dept."
- Country (C):** A dropdown menu showing "CA" with a downward arrow.
- State or Province Name (ST):** A text input field containing "Quebec".
- Locality Name (L):** A text input field containing "Montreal".

Below the input fields, there is a button labeled "Generate Certificate Signing Request". To the right of the button is a warning message: "Warning: Only the latest certificate signing request (CSR) can be downloaded." Below the button and warning, there is a link to download the CSR: "Download CSR: IONODES_R400-3192-1100-0046_2022-04-11-10-07-24.csr".

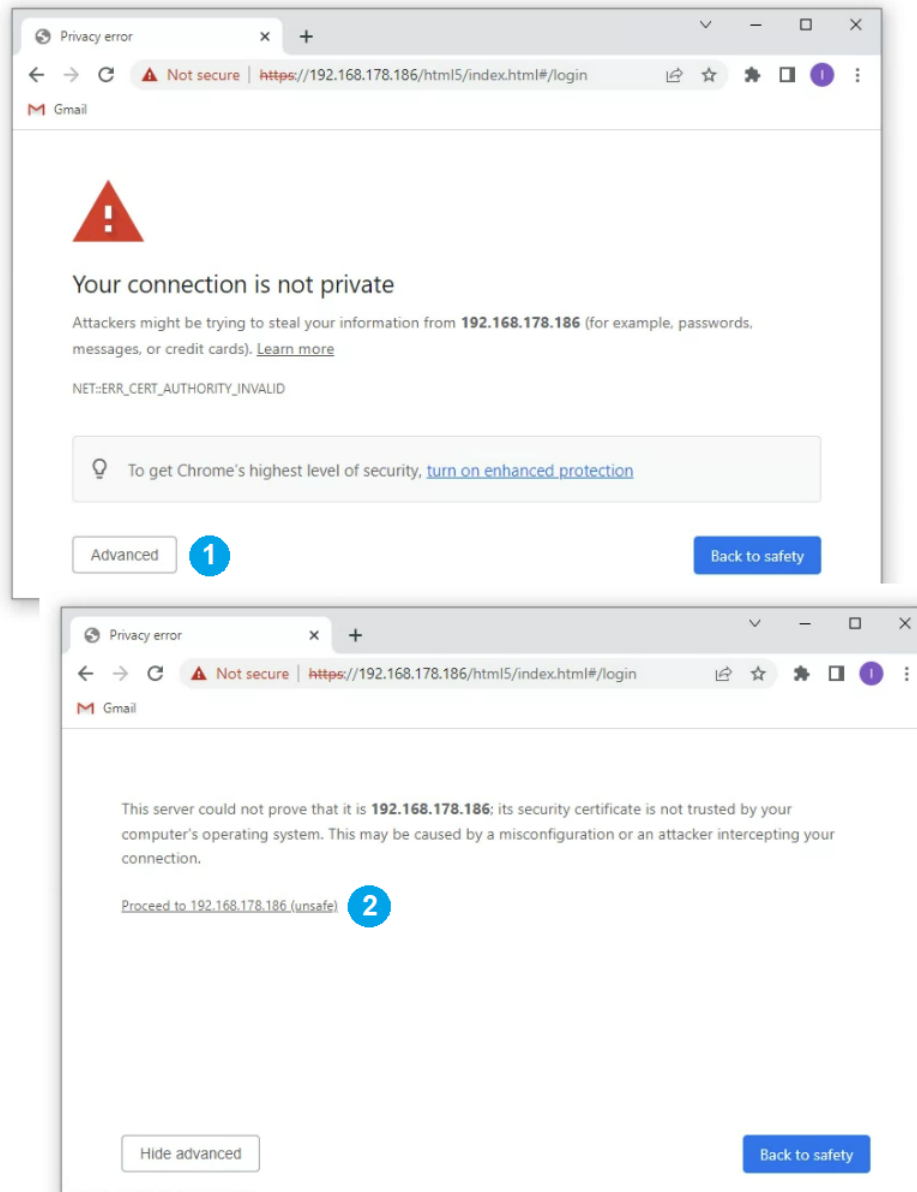
After the user clicks on “Generate Certificate Signing Request” he’ll need to input a password to be used for encrypting the CSR and then the new CSR file (*.csr) will be ready for download.



The *.csr file must be sent to either a local certificate authority (it can be a local server running this service) or to a global certificate authority (IdenTrust, DigiCert, GoDaddy, etc.). Based on the CSR, the CA server will generate a certificate using the CA tools on that server. This is usually a *.pfx or *.p12 file that can be uploaded and used on the decoder.

Note: The tools required to generate the SSL/TLS certificate are not readily available on a standard Windows machine. This feature is really meant for high-end corporate customers that want to have full control over their security inside their network.

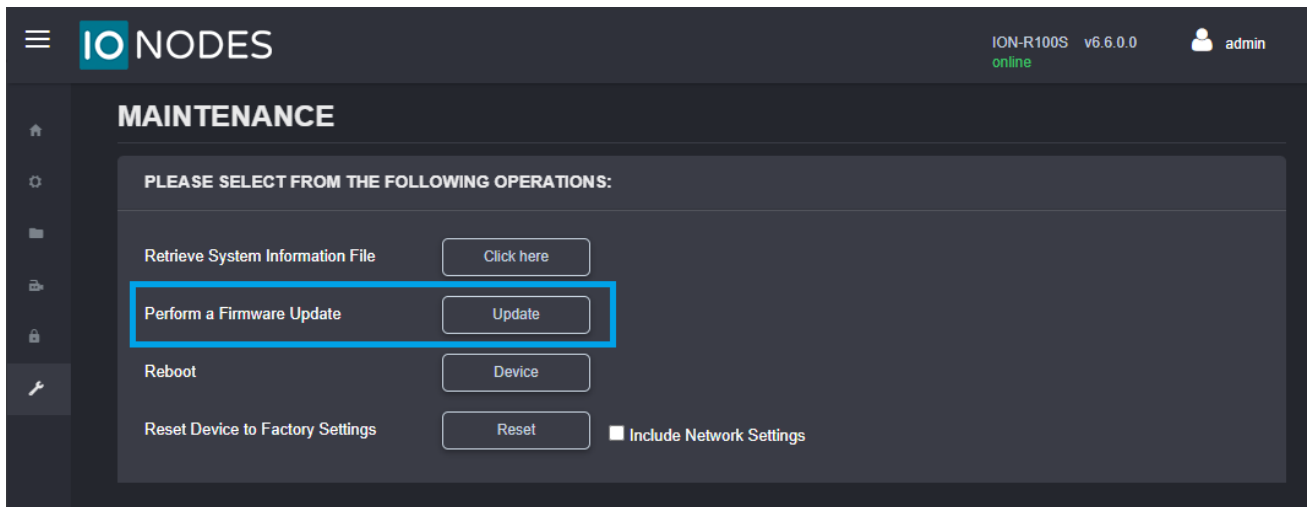
When using HTTPS with the default self-signed certificate, your browser might show a warning. You'll need to hit "Advanced" (1) and then click on "Proceed..." (2) to continue loading the web interface.



13 Performing a Firmware Update

This section describes how to update your ION-R100S to newer firmware versions from the web interface.

1. On the device, switch to configuration view OR navigate to your device's web interface.
2. If not currently logged in, log in using an administrator account's credentials.
3. Click on the **Maintenance** tab.
4. Click on the **Update** button. You will be asked for the firmware update file; please select the **.iof** file which was provided by IONODES.

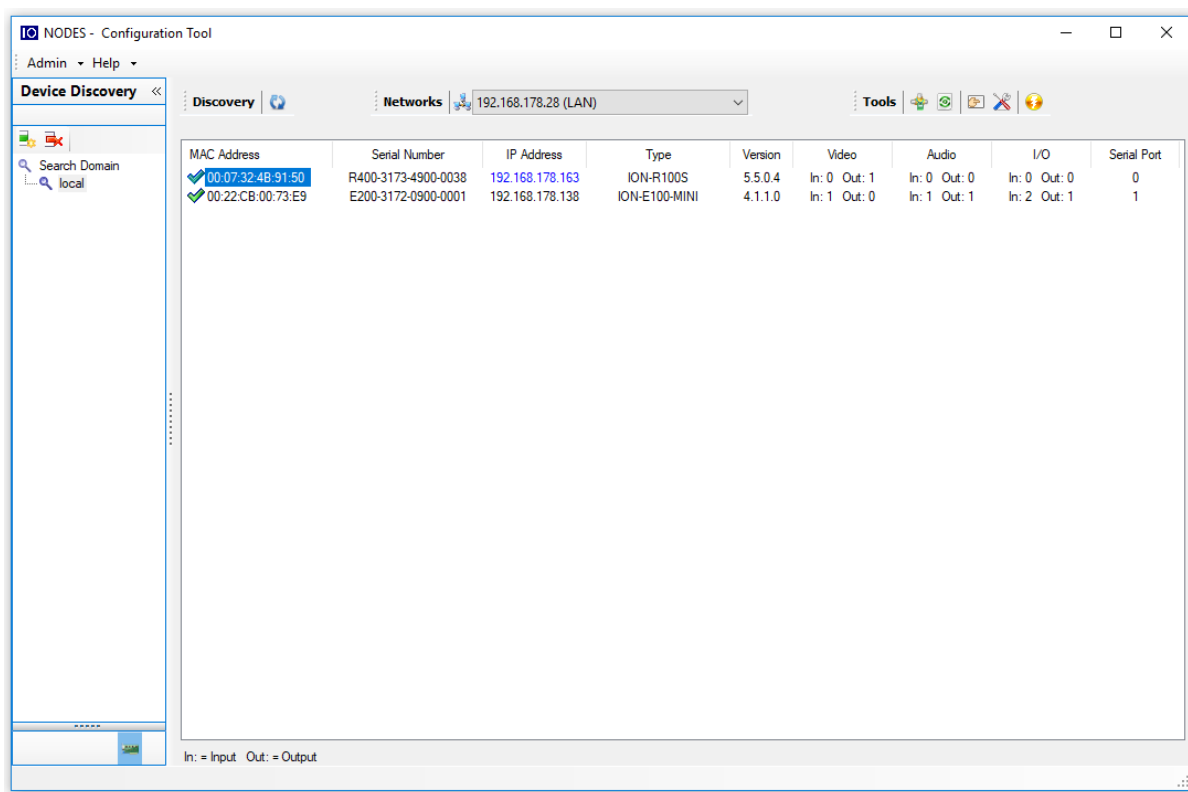


5. You will see the following messages indicating the status of the update:
 - Firmware upload in progress... (100%)
 - Firmware uploaded. Saving to internal storage... (0%)
 - Validating and decompressing firmware... (0%)
 - Firmware ready for installation. Rebooting device... (0%)
 - Web page will disconnect, and the device will reboot.
 - Once the device has rebooted, return to the configuration view. If you are performing the firmware update remotely, the web interface automatically reconnects.
 - Testing firmware stability... (##%)
 - Takes 120 seconds.
 - Firmware update completed. (100%)

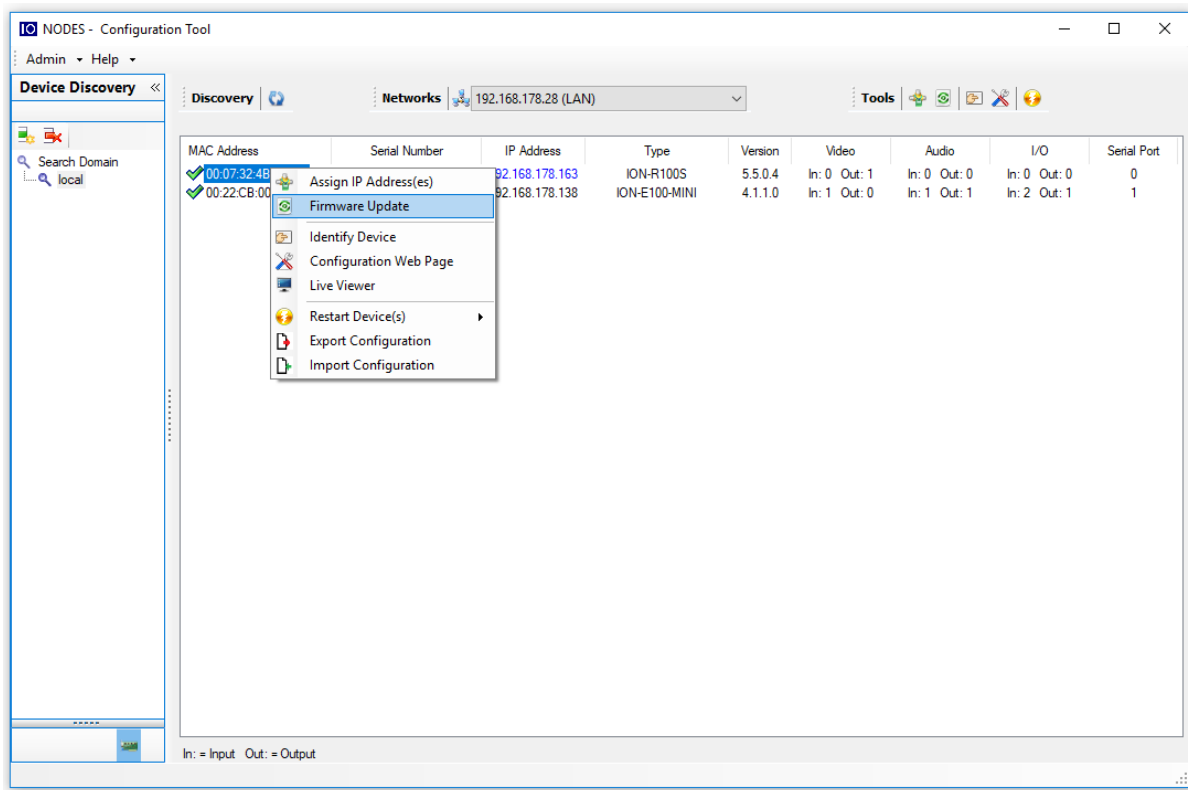
13.1 Batch Firmware Update

This section describes how to perform a batch update of multiple ION-R100S devices to newer firmware versions from the ION Configuration Tool (ICT). The batch firmware update works by starting a firmware update session. Only one session at time is allowed and only 20 devices can be selected by session.

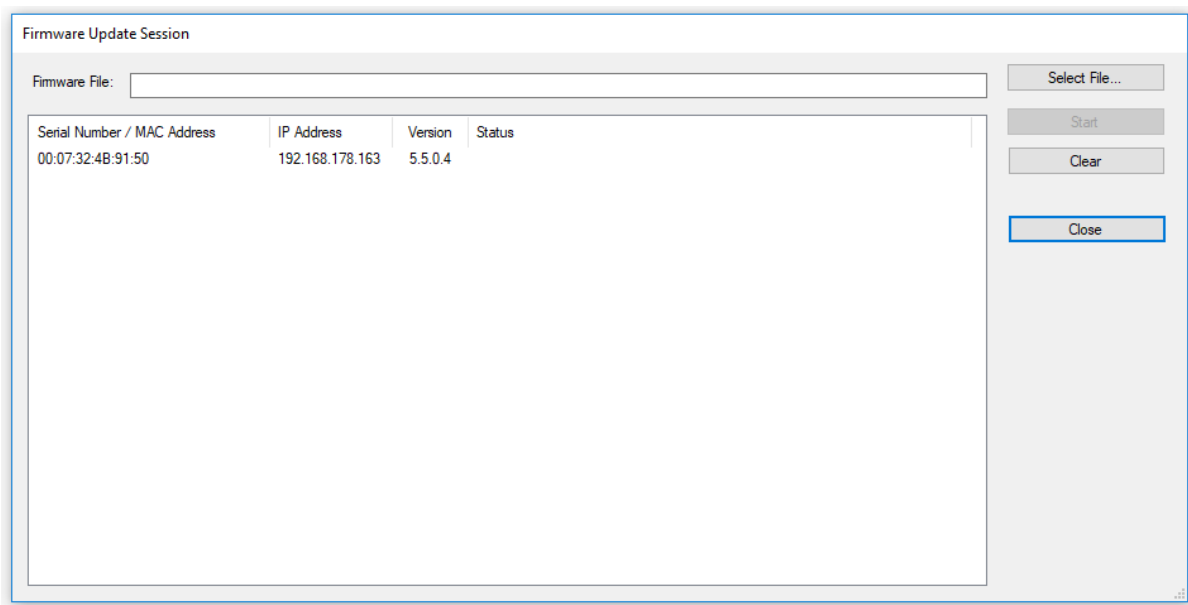
From the ICT, select one or more ION-R100S devices.




By using the right mouse button on the selected device(s), choose the “Firmware Update” menu option.



To start a firmware update session, choose the “.iof” file corresponding to the new firmware by clicking to the “Select File ...” button. Once selected, click to the “Start” button.




Once started, the “Firmware Update Session” window shows the progress of the firmware update. This window can be closed at any moment without losing the current session.

If closed, the progress of the current session can be followed by reopening the “Firmware Update Session” window by clicking the  button from the “Tools” toolbar.

Once done, clear the current session from the “Firmware Update Session” window and restart a new session if needed.

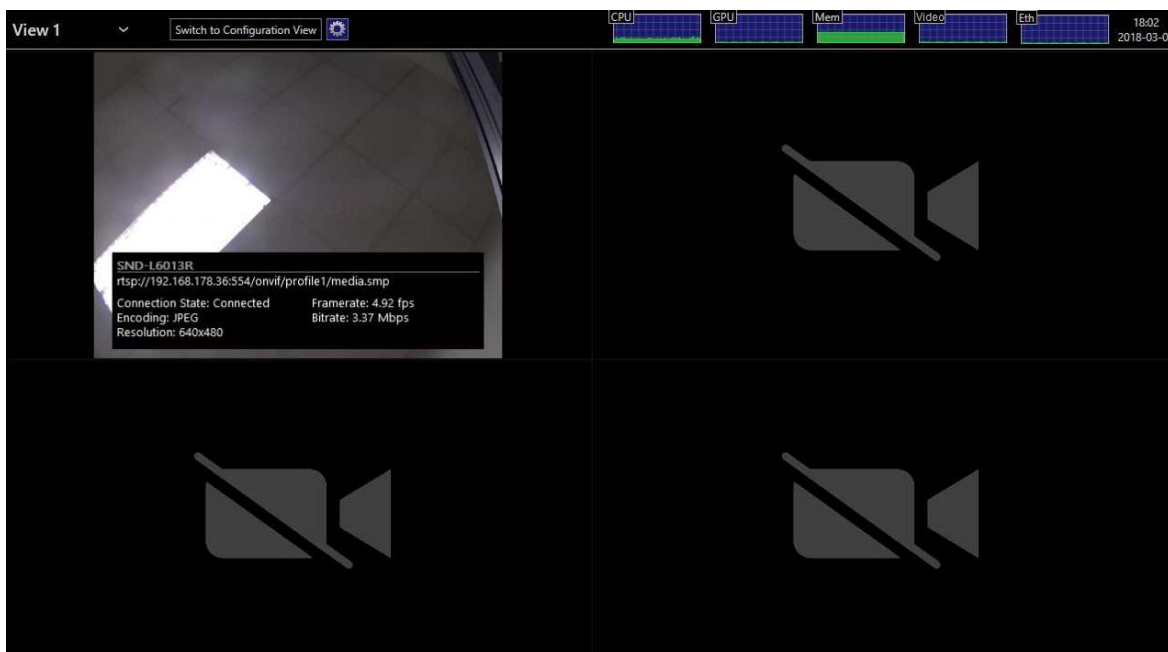
14 Diagnostics

14.1 View Stream Details

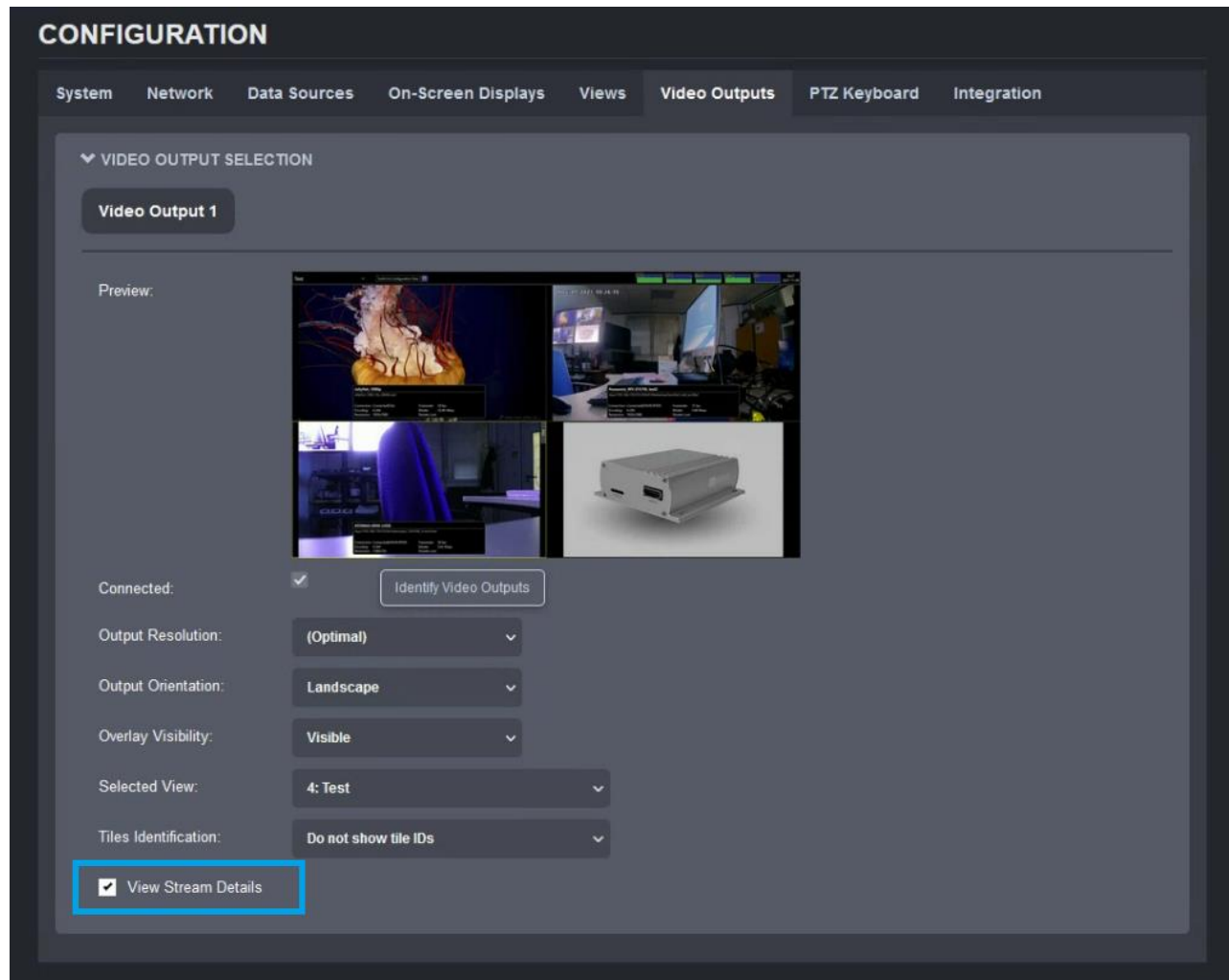
To help diagnose connectivity or performance problems, the ION-R100S can display live details about the video displayed in each tile. To display the stream details, click on the  button at the top of the screen.

The stream details include:

- The name of the data source
- The connection URI
- The current connection status
- The video stream encoding and resolution (not the size of the tile the video is playing in)
- The video stream framerate
- The video stream bitrate
- The network packet lost count (displayed only when one or more packets are lost)



Stream details can also be activated from the Configuration > Video Outputs section of the web interface, by ticking the checkbox at the bottom of the page:



14.2 Safe Mode

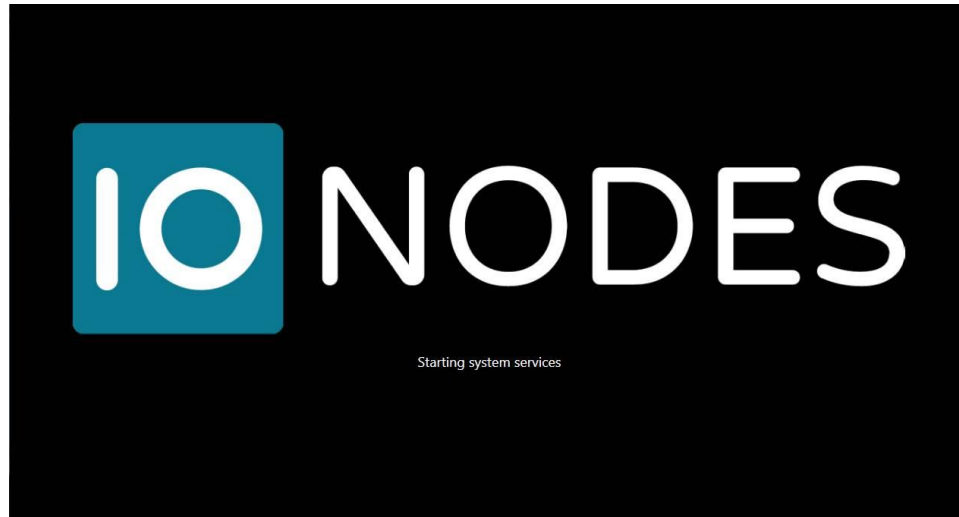
It is possible to configure the ION-R100S in such a way that exceeds its decoding capabilities. Whether it is due to the number of concurrent video streams or the combined bitrate of all video streams being too high, in such scenarios the ION-R100S may run at maximum capacity. In such a scenario, the ION-R100S may become increasingly unresponsive, thus preventing access the configuration of the device to fix the problem.

It is also possible that a video stream from a third-party camera may not strictly follow the H.265 or H.264 video encoding standard, causing problems in the ION-R100S while decoding the video stream.

For all scenarios where the device becomes uncooperative, the ION-R100S offers a solution in the form of safe mode. Safe mode is a special mode of operation where all data sources are forcibly disabled. The device

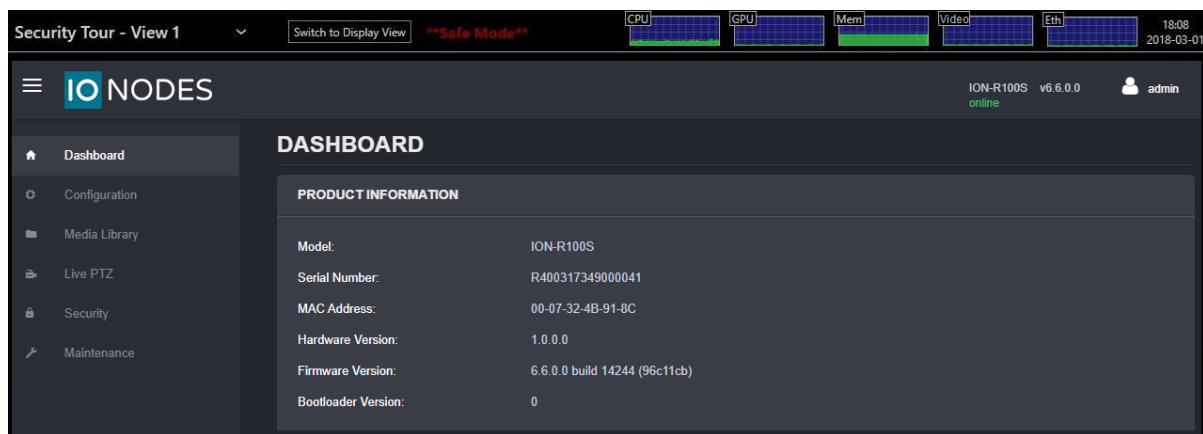
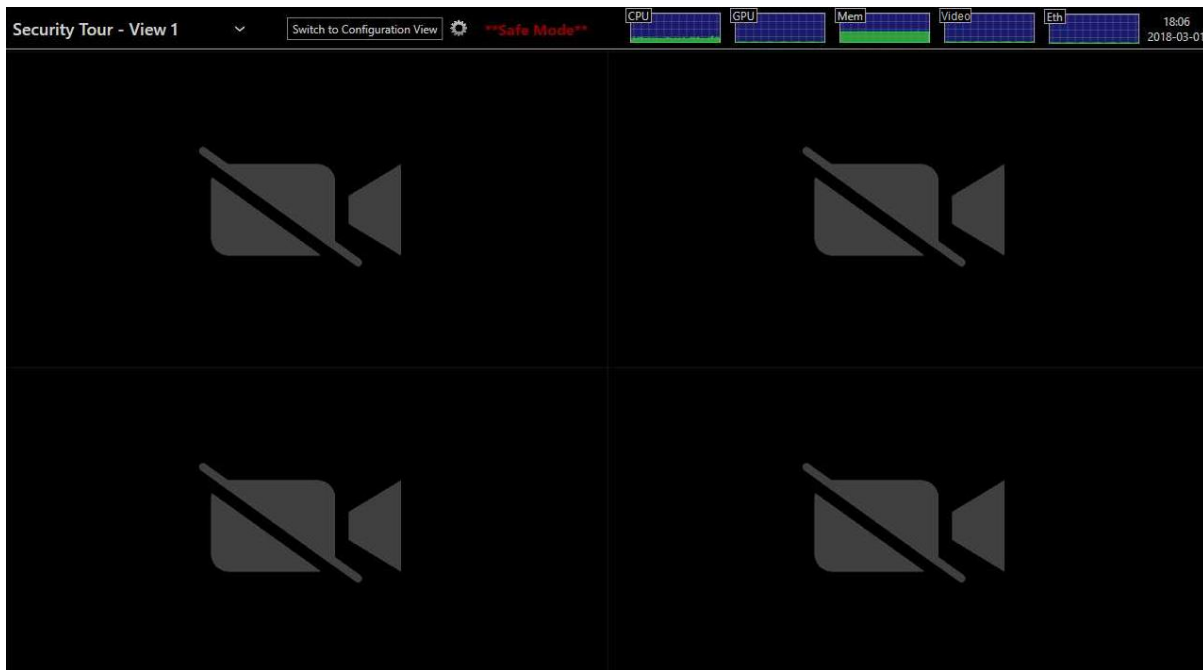
therefore no longer decodes any video, giving you easy access to the configuration of the device to fix the issue before returning to the normal mode of operation.

Safe mode is enabled during the boot-up of the device. It requires a keyboard to be connected to the device. While the ION-R100S is booting up, wait for the device to reach the step shown in the image below:



While the ION-R100S starts its system services, **press and hold the LEFT SHIFT key and RIGHT SHIFT key on the keyboard**. When the device detects the key combination, it acknowledges the switch to safe mode operation as shown below:

Note: It takes only a few seconds for the ION-R100S to start the system services and safe mode can be enabled only during that step of the boot-up sequence. If the device finishes booting up before you press the key combination, you can simply shut down and restart the device and try again.

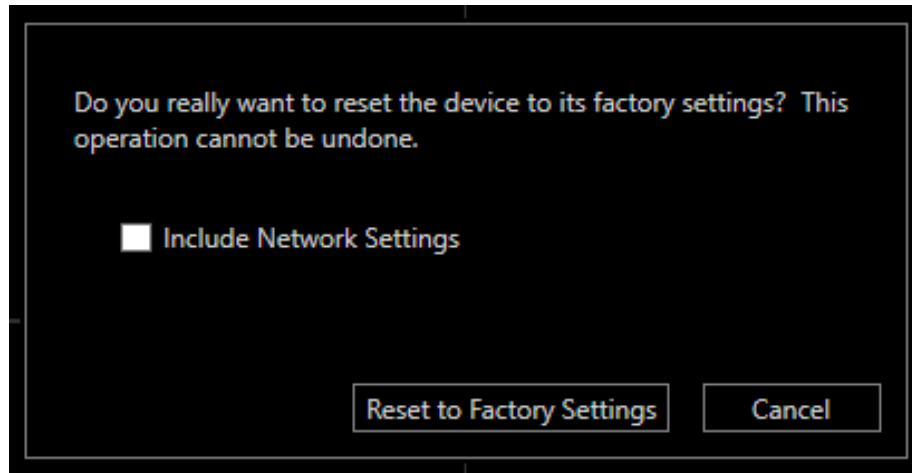


Once you fix the configuration of the ION-R100S, you need to restart the device to return to its normal mode of operation.

When the device is in Safe Mode, the user is also presented an option to perform a reset to factory default settings. This is useful, for instance, if you forget the password to the administrator account.



Once you click on the *"Reset to factory settings"*, a pop-up window will appear asking for confirmation and whether to include or not the network settings.



After the process is started the unit will reboot and reload the factory settings.

Annex A – Statement Limited Warranty

Please visit <https://www.ionodes.com/limited-hardware-warranty/> for the latest warranty information.